ETSI TS 136 521-3 V16.8.0 (2021-06)



LTE;
Evolved Universal Terrestrial Radio Access (E-UTRA);
User Equipment (UE) conformance specification;
Radio transmission and reception;
Part 3: Radio Resource Management (RRM)
conformance testing
(3GPP TS 36.521-3 version 16.8.0 Release 16)



Reference
RTS/TSGR-0536521-3vg80

Keywords
LTE

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.
No recommendation as to products and services or vendors is made or should be implied.
No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.
In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.
The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2021.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal notice

This Technical Specification (TS) has been produced by the ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights 2
Legal notice 2
Modal verbs terminology 2
Foreword 127
Introduction 127
1 Scope 128
2 References 128
3 Definitions, symbols and abbreviations 129
3.1 Definitions 129
3.2 Symbols 131
3.3 Abbreviations 132
3.4 Void 134
3.5 Additional notation 134
3.5.1 Groups of bands 134
3A Requirements for support of RRM 136
3A.1 General 136
3A.2 Requirements Classification for Statistical Testing 137
3A.3 RRM Test Configurations 137
3A.3.1 UE with Single or Multiple Antenna Connector 137
3A.3.2 Test configuration for Inter band test cases 137
3A.3.3 Test configuration for Inter RAT test cases 137
3A.3.4 UE with Multiband Capability 137
3A.3.5 E-UTRAN operating band configuration 138
3A.3.6 CA configuration 138
3A.3.7 HD-FDD category 0 testing 138
3A.4 Antenna Configuration 139
3A.4.1 Antenna connection for 4 Rx capable UEs 139
3A.4.1.1 Introduction 139
3A.4.1.2 Principle of testing 139
3A.4.1.2.1 Single carrier tests 139
3A.4.1.2.2 Carrier aggregation and Dual connectivity tests 140
3A.4.1.2.3 Antenna connection for bands where 2RX is supported 141
3A.4.1.2.4 Antenna connection for bands where 4RX is supported 141
3A.5 Test Cases for Synchronous and Asynchronous Dual Connectivity 141
3A.5.1 Introduction 141
3A.5.2 Principle of Testing 141
3A.6 Test cases for Carrier Aggregation under operation with Frame Structure 3 Test Cases with Different Duplex Modes 141
3A.6.1 Introduction 141
3A.6.2 Principle of testing 142
3A.7 Test case selection criteria for RRM Carrier Aggregation 142
3A.7.1 Introduction 142
3A.7.2 Principle of testing 142
4 E-UTRAN RRC_IDLE State Mobility 142
4.1 E-UTRAN Cell Selection 142
4.2 E-UTRAN Cell Re-Selection 142
4.2.1 E-UTRAN FDD - FDD cell re-selection intra frequency case 142
4.2.1.1 Test purpose 142
4.2.1.2 Test applicability 142
4.2.1.3 Minimum conformance requirements 143
4.2.1.4 Test description 143
4.2.1.4.1 Initial conditions 143

4.2.1.4.2 Test procedure 144
4.2.1.4.3 Message contents 145
4.2.1.5 Test requirement 145
4.2.2 E-UTRAN TDD - TDD cell re-selection intra frequency case 147
4.2.2.1 Test purpose 147
4.2.2.2 Test applicability 147
4.2.2.3 Minimum conformance requirements 147
4.2.2.4 Test description 148
4.2.2.4.1 Initial conditions 148
4.2.2.4.2 Test procedure 148
4.2.2.4.3 Message contents 149
4.2.2.5 Test requirement 150
4.2.3 E-UTRAN FDD - FDD cell re-selection inter frequency case 151
4.2.3.1 Test purpose 151
4.2.3.2 Test applicability 151
4.2.3.3 Minimum conformance requirements 151
4.2.3.4 Test description 152
4.2.3.4.1 Initial conditions 152
4.2.3.4.2 Test procedure 153
4.2.3.4.3 Message contents 154
4.2.3.5 Test requirement 154
4.2.4 E-UTRAN FDD - TDD cell re-selection inter frequency case 157
4.2.4.1 Test purpose 157
4.2.4.2 Test applicability 157
4.2.4.3 Minimum conformance requirements 157
4.2.4.4 Test description 158
4.2.4.4.1 Initial conditions 158
4.2.4.4.2 Test procedure 159
4.2.4.4.3 Message contents 160
4.2.4.5 Test requirement 160
4.2.5 E-UTRAN TDD - FDD cell re-selection inter frequency case 163
4.2.5.1 Test purpose 163
4.2.5.2 Test applicability 163
4.2.5.3 Minimum conformance requirements 163
4.2.5.4 Test description 164
4.2.5.4.1 Initial conditions 164
4.2.5.4.2 Test procedure 165
4.2.5.4.3 Message contents 166
4.2.5.5 Test requirement 166
4.2.6 E-UTRAN TDD - TDD cell re-selection inter frequency case 169
4.2.6.1 Test purpose 169
4.2.6.2 Test applicability 169
4.2.6.3 Minimum conformance requirements 169
4.2.6.4 Test description 170
4.2.6.4.1 Initial conditions 170
4.2.6.4.2 Test procedure 171
4.2.6.4.3 Message contents 172
4.2.6.5 Test requirement 172
4.2.7 E-UTRAN FDD – FDD Inter frequency case in the existence of non-allowed CSG cell 175
4.2.7.1 Test purpose 175
4.2.7.2 Test applicability 175
4.2.7.3 Minimum conformance requirements 175
4.2.7.4 Test description 176
4.2.7.4.1 Initial conditions 176
4.2.7.4.2 Test procedure 177
4.2.7.4.3 Message contents 178
4.2.7.5 Test requirement 180
4.2.8 E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell 182
4.2.8.1 Test purpose 182
4.2.8.2 Test applicability 182
4.2.8.3 Minimum conformance requirements 182
4.2.8.4 Test description 183

4.2.8.4.1 Initial conditions 183
4.2.8.4.2 Test procedure 184
4.2.8.4.3 Message contents 185
4.2.8.5 Test requirement 187
4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth 189
4.2.9.1 Test purpose 189
4.2.9.2 Test applicability 189
4.2.9.3 Minimum conformance requirements 189
4.2.9.4 Test description 189
4.2.9.4.1 Initial conditions 189
4.2.9.4.2 Test procedure 189
4.2.9.4.3 Message contents 189
4.2.9.5 Test requirement 190
4.2.10 E-UTRAN FDD – FDD reselection using an increased number of carriers 190
4.2.10.1 Test purpose 190
4.2.10.2 Test applicability 190
4.2.10.3 Minimum conformance requirements 190
4.2.10.4 Test description 192
4.2.10.4.1 Initial conditions 192
4.2.10.4.2 Test procedure 193
4.2.10.4.3 Message contents 195
4.2.10.5 Test requirement 195
4.2.11 E-UTRAN TDD – TDD reselection using an increased number of carriers 197
4.2.11.1 Test purpose 197
4.2.11.2 Test applicability 197
4.2.11.3 Minimum conformance requirements 197
4.2.11.4 Test description 197
4.2.11.4.1 Initial conditions 197
4.2.11.4.2 Test procedure 199
4.2.11.4.3 Message contents 200
4.2.11.5 Test requirement 200
4.2.12 E-UTRAN FDD – FDD Intra frequency case for CE UE in normal coverage 203
4.2.12.1 Test purpose 203
4.2.12.2 Test applicability 203
4.2.12.3 Minimum conformance requirements 203
4.2.12.4 Test description 204
4.2.12.4.1 Initial conditions 204
4.2.12.4.2 Test procedure 205
4.2.12.4.3 Message contents 206
4.2.12.5 Test requirement 206
4.2.13 E-UTRAN HD – FDD Intra frequency case for CE UE in normal coverage 208
4.2.13.1 Test purpose 208
4.2.13.2 Test applicability 208
4.2.13.3 Minimum conformance requirements 208
4.2.13.4 Test description 208
4.2.13.4.1 Initial conditions 208
4.2.13.4.2 Test procedure 209
4.2.13.4.3 Message contents 209
4.2.13.5 Test requirement 209
4.2.14 E-UTRAN TDD – TDD Intra frequency case for CE UE in normal coverage 211
4.2.14.1 Test purpose 211
4.2.14.2 Test applicability 211
4.2.14.3 Minimum conformance requirements 211
4.2.14.4 Test description 211
4.2.14.4.1 Initial conditions 211
4.2.14.4.2 Test procedure 212
4.2.14.4.3 Message contents 212
4.2.14.5 Test requirement 212
4.2.15 E-UTRAN FDD – FDD Intra frequency case for CE UE in enhanced coverage 214
4.2.15.1 Test purpose 214
4.2.15.2 Test applicability 214
4.2.15.3 Minimum conformance requirements 214

4.2.15.4 Test description 215
4.2.15.4.1 Initial conditions 215
4.2.15.4.2 Test procedure 216
4.2.15.4.3 Message contents 217
4.2.15.5 Test requirement 217
4.2.16 E-UTRAN HD – FDD Intra frequency case for CE UE in enhanced coverage 219
4.2.16.1 Test purpose 219
4.2.16.2 Test applicability 219
4.2.16.3 Minimum conformance requirements 219
4.2.16.4 Test description 219
4.2.16.4.1 Initial conditions 219
4.2.16.4.2 Test procedure 220
4.2.16.4.3 Message contents 220
4.2.16.5 Test requirement 220
4.2.17 E-UTRAN TDD – TDD Intra frequency case for CE UE in enhanced coverage 222
4.2.17.1 Test purpose 222
4.2.17.2 Test applicability 222
4.2.17.3 Minimum conformance requirements 222
4.2.17.4 Test description 222
4.2.17.4.1 Initial conditions 222
4.2.17.4.2 Test procedure 223
4.2.17.4.3 Message contents 223
4.2.17.5 Test requirement 223
4.2.18 HD-FDD Intra frequency cell reselection for Category NB1 UE in In-Band Mode under Normal Coverage 225
4.2.18.1 Test purpose 225
4.2.18.2 Test applicability 225
4.2.18.3 Minimum conformance requirements 225
4.2.18.4 Test description 226
4.2.18.4.1 Initial conditions 226
4.2.18.4.2 Test procedure 227
4.2.18.4.3 Message contents 228
4.2.18.5 Test requirement 228
4.2.19 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage 231
4.2.19.1 Test purpose 231
4.2.19.2 Test applicability 231
4.2.19.3 Minimum conformance requirements 231
4.2.19.4 Test description 232
4.2.19.4.1 Initial conditions 232
4.2.19.4.2 Test procedure 232
4.2.19.4.3 Message contents 233
4.2.19.5 Test requirement 234
4.2.20 E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis 236
4.2.20.1 Test purpose 236
4.2.20.2 Test applicability 236
4.2.20.3 Minimum conformance requirements 236
4.2.20.4 Test description 237
4.2.20.4.1 Initial conditions 237
4.2.20.4.2 Test procedure 237
4.2.20.4.3 Message contents 238
4.2.20.5 Test requirement 238
4.2.21 E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis 240
4.2.21.1 Test purpose 240
4.2.21.2 Test applicability 240
4.2.21.3 Minimum conformance requirements 240
4.2.21.4 Test description 240
4.2.21.4.1 Initial conditions 240
4.2.21.4.2 Test procedure 241
4.2.21.4.3 Message contents 241
4.2.21.5 Test requirement 241
4.2.22 E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag 243

4.2.22.1 Test purpose 243
4.2.22.2 Test applicability 243
4.2.22.3 Minimum conformance requirements 243
4.2.22.4 Test description 244
4.2.22.4.1 Initial conditions 244
4.2.22.4.2 Test procedure 245
4.2.22.4.3 Message contents 246
4.2.22.5 Test requirement 246
4.2.23 E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag 248
4.2.23.1 Test purpose 248
4.2.23.2 Test applicability 248
4.2.23.3 Minimum conformance requirements 248
4.2.23.4 Test description 249
4.2.23.4.1 Initial conditions 249
4.2.23.4.2 Test procedure 250
4.2.23.4.3 Message contents 251
4.2.23.5 Test requirement 251
4.2.24 HD – FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage 253
4.2.24.1 Test purpose 253
4.2.24.2 Test applicability 253
4.2.24.3 Minimum conformance requirements 253
4.2.24.4 Test description 254
4.2.24.4.1 Initial conditions 254
4.2.24.4.2 Test procedure 255
4.2.24.4.3 Message contents 256
4.2.24.5 Test requirement 256
4.2.25 E-UTRAN FDD – FDD Inter frequency case for CE UE in normal coverage 259
4.2.25.1 Test purpose 259
4.2.25.2 Test applicability 259
4.2.25.3 Minimum conformance requirements 259
4.2.25.4 Test description 260
4.2.25.4.1 Initial conditions 260
4.2.25.4.2 Test procedure 261
4.2.25.4.3 Message contents 261
4.2.25.5 Test requirement 261
4.2.26 E-UTRAN HD – FDD Inter frequency case for CE UE in normal coverage 263
4.2.26.1 Test purpose 263
4.2.26.2 Test applicability 263
4.2.26.3 Minimum conformance requirements 263
4.2.26.4 Test description 263
4.2.26.4.1 Initial conditions 263
4.2.26.4.2 Test procedure 264
4.2.26.4.3 Message contents 264
4.2.26.5 Test requirement 264
4.2.27 E-UTRAN TDD – TDD Inter frequency case for CE UE in normal coverage 266
4.2.27.1 Test purpose 266
4.2.27.2 Test applicability 266
4.2.27.3 Minimum conformance requirements 266
4.2.27.4 Test description 266
4.2.27.4.1 Initial conditions 266
4.2.27.4.2 Test procedure 267
4.2.27.4.3 Message contents 267
4.2.27.5 Test requirement 267
4.2.28 E-UTRAN FDD – FDD Inter frequency case for CE UE in enhanced coverage 269
4.2.28.1 Test purpose 269
4.2.28.2 Test applicability 269
4.2.28.3 Minimum conformance requirements 269
4.2.28.4 Test description 270
4.2.28.4.1 Initial conditions 270
4.2.28.4.2 Test procedure 271
4.2.28.4.3 Message contents 272

4.2.28.5 Test requirement 272
4.2.29 E-UTRAN HD – FDD Inter frequency case for CE UE in enhanced coverage 274
4.2.29.1 Test purpose 274
4.2.29.2 Test applicability 274
4.2.29.3 Minimum conformance requirements 274
4.2.29.4 Test description 274
4.2.29.4.1 Initial conditions 274
4.2.29.4.2 Test procedure 275
4.2.29.4.3 Message contents 275
4.2.29.5 Test requirement 275
4.2.30 E-UTRAN TDD Inter frequency case for CE UE in enhanced coverage 277
4.2.30.1 Test purpose 277
4.2.30.2 Test applicability 277
4.2.30.3 Minimum conformance requirements 277
4.2.30.4 Test description 277
4.2.30.4.1 Initial conditions 277
4.2.30.4.2 Test procedure 278
4.2.30.4.3 Message contents 278
4.2.30.5 Test requirement 278
4.2.31 E-UTRAN FDD – FDD Inter frequency case for UE Category 1bis 280
4.2.31.1 Test purpose 280
4.2.31.2 Test applicability 280
4.2.31.3 Minimum conformance requirements 280
4.2.31.4 Test description 281
4.2.31.4.1 Initial conditions 281
4.2.31.4.2 Test procedure 281
4.2.31.4.3 Message contents 281
4.2.31.5 Test requirement 282
4.2.32 E-UTRAN FDD – TDD Inter frequency case for UE Category 1bis 284
4.2.32.1 Test purpose 284
4.2.32.2 Test applicability 284
4.2.32.3 Minimum conformance requirements 284
4.2.32.4 Test description 284
4.2.32.4.1 Initial conditions 284
4.2.32.4.2 Test procedure 284
4.2.32.4.3 Message contents 284
4.2.32.5 Test requirement 285
4.2.33 E-UTRAN TDD – FDD Inter frequency case for UE Category 1bis 287
4.2.33.1 Test purpose 287
4.2.33.2 Test applicability 287
4.2.33.3 Minimum conformance requirements 287
4.2.33.4 Test description 287
4.2.33.4.1 Initial conditions 287
4.2.33.4.2 Test procedure 287
4.2.33.4.3 Message contents 287
4.2.33.5 Test requirement 288
4.2.34 E-UTRAN TDD – TDD Inter frequency case for UE Category 1bis 290
4.2.34.1 Test purpose 290
4.2.34.2 Test applicability 290
4.2.34.3 Minimum conformance requirements 290
4.2.34.4 Test description 290
4.2.34.4.1 Initial conditions 290
4.2.34.4.2 Test procedure 290
4.2.34.4.3 Message contents 290
4.2.34.5 Test requirement 291
4.2.35 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage 293
4.2.35.1 Test purpose 293
4.2.35.2 Test applicability 293
4.2.35.3 Minimum conformance requirements 293
4.2.35.4 Test description 294
4.2.35.4.1 Initial conditions 294

4.2.35.4.2 Test procedure 295
4.2.35.4.3 Message contents 295
4.2.35.5 Test requirement 295
4.2.36 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage 298
4.2.36.1 Test purpose 298
4.2.36.2 Test applicability 298
4.2.36.3 Minimum conformance requirements 298
4.2.36.4 Test description 299
4.2.36.4.1 Initial conditions 299
4.2.36.4.2 Test procedure 300
4.2.36.4.3 Message contents 300
4.2.36.5 Test requirement 300
4.2.37 E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage 303
4.2.37.1 Test purpose 303
4.2.37.2 Test applicability 303
4.2.37.3 Minimum conformance requirements 303
4.2.37.4 Test description 305
4.2.37.4.1 Initial conditions 305
4.2.37.4.2 Test procedure 305
4.2.37.4.3 Message contents 305
4.2.37.5 Test requirement 306
4.2.38 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage with serving cell RRM measurement relaxation 308
4.2.38.1 Test purpose 308
4.2.38.2 Test applicability 308
4.2.38.3 Minimum conformance requirements 308
4.2.38.4 Test description 309
4.2.38.4.1 Initial conditions 309
4.2.38.4.2 Test procedure 310
4.2.38.4.3 Message contents 311
4.2.38.5 Test requirement 312
4.3 E-UTRAN to UTRAN Cell Re-Selection 315
4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection 315
4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority 315
4.3.1.1.1 Test purpose 315
4.3.1.1.2 Test applicability 315
4.3.1.1.3 Minimum conformance requirements 315
4.3.1.1.4 Test description 316
4.3.1.1.4.1 Initial conditions 316
4.3.1.1.4.2 Test procedure 316
4.3.1.1.4.3 Message contents 317
4.3.1.1.5 Test requirement 318
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority 320
4.3.1.2.1 Test purpose 320
4.3.1.2.2 Test applicability 320
4.3.1.2.3 Minimum conformance requirements 321
4.3.1.2.4 Test description 321
4.3.1.2.4.1 Initial conditions 321
4.3.1.2.4.2 Test procedure 322
4.3.1.2.4.3 Message contents 322
4.3.1.2.5 Test requirement 323
4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority 325
4.3.1.3.1 Test purpose 325
4.3.1.3.2 Test applicability 325
4.3.1.3.3 Minimum conformance requirements 326
4.3.1.3.4 Test description 326
4.3.1.3.4.1 Initial conditions 326
4.3.1.3.4.2 Test procedure 327
4.3.1.3.4.3 Message contents 328

4.3.1.3.5 Test requirement 329
4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth 333
4.3.1.4.1 Test purpose 333
4.3.1.4.2 Test applicability 334
4.3.1.4.3 Minimum conformance requirements 334
4.3.1.4.4 Test description 334
4.3.1.4.4.1 Initial conditions 334
4.3.1.4.4.2 Test procedure 334
4.3.1.4.4.3 Message contents 334
4.3.1.4.5 Test requirement 335
4.3.1.5 Idle mode FDD to UTRA FDD interRAT reselection 335
4.3.1.5.1 Test purpose 335
4.3.1.5.2 Test applicability 335
4.3.1.5.3 Minimum conformance requirements 336
4.3.1.5.4 Test description 337
4.3.1.5.4.1 Initial conditions 337
4.3.1.5.4.2 Test procedure 339
4.3.1.5.4.3 Message contents 340
4.3.1.5.5 Test requirement 342
4.3.2 E-UTRAN FDD - UTRAN TDD cell re-selection 344
4.3.2.1 Test purpose 344
4.3.2.2 Test applicability 344
4.3.2.3 Minimum conformance requirements 344
4.3.2.3.1 3.84Mcps TDD option 344
4.3.2.3.2 1.28Mcps TDD option 344
4.3.2.3.3 7.68Mcps TDD option 345
4.3.2.4 Test description 345
4.3.2.4.1 3.84Mcps TDD option 345
4.3.2.4.2 1.28Mcps TDD option 345
4.3.2.4.2.1 Initial conditions 345
4.3.2.4.2.2 Test procedure 346
4.3.2.4.2.3 Message contents 347
4.3.2.4.3 7.68 Mcps TDD option 347
4.3.2.5 Test requirement 347
4.3.2.5.1 3.84Mcps TDD option 347
4.3.2.5.2 1.28Mcps TDD option 347
4.3.2.5.3 7.68 Mcps TDD option 349
4.3.2A E-UTRA FDD to UTRA TDD cell re-selection for IncMon 349
4.3.2A.1 Test purpose 349
4.3.2A.2 Test applicability 349
4.3.2A.3 Minimum conformance requirements 349
4.3.2A.4 Test description 351
4.3.2A.4.1 Initial conditions 351
4.3.2A.4.2 Test procedure 352
4.3.2A.4.3 Message contents 353
4.3.2A.5 Test requirement 354
4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection 357
4.3.3.1 Test purpose 357
4.3.3.2 Test applicability 357
4.3.3.3 Minimum conformance requirements 357
4.3.3.4 Test description 358
4.3.3.4.1 Initial conditions 358
4.3.3.4.2 Test procedure 359
4.3.3.4.3 Message contents 359
4.3.3.5 Test requirement 360
4.3.3A Idle mode TDD to UTRA FDD interRAT reselection 362
4.3.3A.1 Test purpose 362
4.3.3A.2 Test applicability 362
4.3.3A.3 Minimum conformance requirements 362
4.3.3A.4 Test description 363
4.3.3A.4.1 Initial conditions 363

4.3.3A.4.2 Test procedure 364
4.3.3A.4.3 Message contents 366
4.3.3A.5 Test requirement 367
4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection 369
4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection: UTRA is of higher priority 369
4.3.4.1.1 Test purpose 369
4.3.4.1.2 Test applicability 369
4.3.4.1.3 Minimum conformance requirements 369
4.3.4.1.4 Test description 370
4.3.4.1.4.1 Initial conditions 370
4.3.4.1.4.2 Test procedure 371
4.3.4.1.4.3 Message contents 372
4.3.4.1.5 Test requirement 372
4.3.4.2 E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority 374
4.3.4.2.1 Test purpose 374
4.3.4.2.2 Test applicability 375
4.3.4.2.3 Minimum conformance requirements 375
4.3.4.2.4 Test description 375
4.3.4.2.4.1 Initial conditions 375
4.3.4.2.4.2 Test procedure 376
4.3.4.2.4.3 Message contents 377
4.3.4.2.5 Test requirement 377
4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority 379
4.3.4.3.1 Test purpose 379
4.3.4.3.2 Test applicability 379
4.3.4.3.3 Minimum conformance requirements 379
4.3.4.3.4 Test description 380
4.3.4.3.4.1 Initial conditions 380
4.3.4.3.4.2 Test procedure 381
4.3.4.3.4.3 Message contents 382
4.3.4.3.5 Test requirement 383
4.3.4.4 E-UTRA TDD to UTRA TDD cell re-selection for IncMon 387
4.3.4.4.1 Test purpose 387
4.3.4.4.2 Test applicability 387
4.3.4.4.3 Minimum conformance requirements 388
4.3.4.4.4 Test description 388
4.3.4.4.4.1 Initial conditions 388
4.3.4.4.4.2 Test procedure 389
4.3.4.4.4.3 Message contents 390
4.3.4.4.5 Test requirement 392
4.4 E-UTRAN to GSM Cell Re-Selection 395
4.4.1 E-UTRAN FDD - GSM cell re-selection 395
4.4.1.1 Test purpose 395
4.4.1.2 Test applicability 395
4.4.1.3 Minimum conformance requirements 395
4.4.1.4 Test description 396
4.4.1.4.1 Initial conditions 396
4.4.1.4.2 Test procedure 397
4.4.1.4.3 Message contents 398
4.4.1.5 Test requirement 398
4.4.2 E-UTRAN TDD - GSM cell re-selection 399
4.4.2.1 Test purpose 399
4.4.2.2 Test applicability 399
4.4.2.3 Minimum conformance requirements 399
4.4.2.4 Test description 400
4.4.2.4.1 Initial conditions 400
4.4.2.4.2 Test procedure 401
4.4.2.4.3 Message contents 402
4.4.2.5 Test requirement 402
4.5 E-UTRAN to HRPD Cell Re-Selection 403
4.5.1 E-UTRAN FDD - HRPD Cell re-selection 403

4.5.1.1 E-UTRAN FDD - HRPD Cell Reselection: HRPD is of Lower Priority 403
4.5.1.1.1 Test purpose 403
4.5.1.1.2 Test applicability 403
4.5.1.1.3 Minimum conformance requirements 403
4.5.1.1.4 Test description 404
4.5.1.1.5 Test requirement 405
4.5.2 E-UTRAN TDD - HRPD Cell re-selection 407
4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority 407
4.5.2.1.1 Test purpose 407
4.5.2.1.2 Test applicability 407
4.5.2.1.3 Minimum conformance requirements 407
4.5.2.1.4 Test description 407
4.5.2.1.5 Test requirement 409
4.6 E-UTRAN to cdma2000 1xRTT Cell Re-Selection 410
4.6.1 E-UTRAN FDD - cdma2000 1xRTT Cell re-selection 410
4.6.1.1 E-UTRAN FDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority 410
4.6.1.1.1 Test purpose 411
4.6.1.1.2 Test applicability 411
4.6.1.1.3 Minimum conformance requirements 411
4.6.1.1.4 Test description 411
4.6.1.1.5 Test requirements 413
4.6.2 E-UTRAN TDD - cdma2000 1xRTT Cell re-selection 414
4.6.2.1 E-UTRAN TDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority 414
4.6.2.1.1 Test purpose 414
4.6.2.1.2 Test applicability 414
4.6.2.1.3 Minimum conformance requirements 415
4.6.2.1.4 Test description 415
4.6.2.1.5 Test requirements 416

5 E-UTRAN RRC_CONNECTED State Mobility 418
5.1 E-UTRAN Handover 419
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case 419
5.1.1.1 Test purpose 419
5.1.1.2 Test applicability 419
5.1.1.3 Minimum conformance requirements 419
5.1.1.4 Test description 419
5.1.1.4.1 Initial conditions 419
5.1.1.4.2 Test procedure 420
5.1.1.4.3 Message contents 421
5.1.1.5 Test requirement 422
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case 424
5.1.2.1 Test purpose 424
5.1.2.2 Test applicability 424
5.1.2.3 Minimum conformance requirements 424
5.1.2.4 Test description 424
5.1.2.4.1 Initial conditions 424
5.1.2.4.2 Test procedure 425
5.1.2.4.3 Message contents 426
5.1.2.5 Test requirement 427
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case 429
5.1.3.1 Test purpose 429
5.1.3.2 Test applicability 429
5.1.3.3 Minimum conformance requirements 429
5.1.3.4 Test description 429
5.1.3.4.1 Initial conditions 429
5.1.3.4.2 Test procedure 430
5.1.3.4.3 Message contents 431
5.1.3.5 Test requirement 432
5.1.3_2 E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis 434
5.1.3_2.1 Test purpose 434
5.1.3_2.2 Test applicability 434
5.1.3_2.3 Minimum conformance requirements 434

5.1.3_2.4 Test description 434
5.1.3_2.4.1 Initial conditions 434
5.1.3_2.4.2 Test procedure 435
5.1.3_2.4.3 Message contents 435
5.1.3_2.5 Test requirement 435
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case 437
5.1.4.1 Test purpose 437
5.1.4.2 Test applicability 437
5.1.4.3 Minimum conformance requirements 437
5.1.4.4 Test description 437
5.1.4.4.1 Initial conditions 437
5.1.4.4.2 Test procedure 438
5.1.4.4.3 Message contents 439
5.1.4.5 Test requirement 440
5.1.4_2 E-UTRAN TDD-TDD Handover inter frequency case for UE Category 1bis 442
5.1.4_2.1 Test purpose 442
5.1.4_2.2 Test applicability 442
5.1.4_2.3 Minimum conformance requirements 442
5.1.4_2.4 Test description 442
5.1.4_2.4.1 Initial conditions 442
5.1.4_2.4.2 Test procedure 443
5.1.4_2.4.3 Message contents 443
5.1.4_2.5 Test requirement 443
5.1.5 E-UTRAN FDD-FDD inter frequency Handover: unknown target cell 445
5.1.5.1 Test purpose 445
5.1.5.2 Test applicability 445
5.1.5.3 Minimum conformance requirements 445
5.1.5.4 Test description 445
5.1.5.4.1 Initial conditions 445
5.1.5.4.2 Test procedure 446
5.1.5.4.3 Message contents 447
5.1.5.5 Test requirement 447
5.1.5_2 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell for UE Category 1bis 448
5.1.5_2.1 Test purpose 448
5.1.5_2.2 Test applicability 448
5.1.5_2.3 Minimum conformance requirements 448
5.1.5_2.4 Test description 449
5.1.5_2.4.1 Initial conditions 449
5.1.5_2.4.2 Test procedure 449
5.1.5_2.4.3 Message contents 449
5.1.5_2.5 Test requirement 449
5.1.6 E-UTRAN TDD-TDD inter frequency handover: unknown target cell 451
5.1.6.1 Test purpose 451
5.1.6.2 Test applicability 451
5.1.6.3 Minimum conformance requirements 451
5.1.6.4 Test description 451
5.1.6.4.1 Initial conditions 451
5.1.6.4.2 Test procedure 452
5.1.6.4.3 Message contents 453
5.1.6.5 Test requirement 453
5.1.6_2 E-UTRAN TDD-TDD inter frequency handover: unknown target cell for UE Category 1bis 455
5.1.6_2.1 Test purpose 455
5.1.6_2.2 Test applicability 455
5.1.6_2.3 Minimum conformance requirements 455
5.1.6_2.4 Test description 455
5.1.6_2.4.1 Initial conditions 455
5.1.6_2.4.2 Test procedure 456
5.1.6_2.4.3 Message contents 456
5.1.6_2.5 Test requirement 456
5.1.7 E-UTRAN FDD-TDD Handover inter frequency case 457
5.1.7.1 Test purpose 457
5.1.7.2 Test applicability 457

5.1.7.3 Minimum conformance requirements 457
5.1.7.4 Test description 458
5.1.7.4.1 Initial conditions 458
5.1.7.4.2 Test procedure 459
5.1.7.4.3 Message contents 460
5.1.7.5 Test requirement 461
5.1.7_2 E-UTRAN FDD – TDD Inter frequency handover for UE Category 1bis 463
5.1.7_2.1 Test purpose 463
5.1.7_2.2 Test applicability 463
5.1.7_2.3 Minimum conformance requirements 463
5.1.7_2.4 Test description 464
5.1.7_2.4.1 Initial conditions 464
5.1.7_2.4.2 Test procedure 464
5.1.7_2.4.3 Message contents 464
5.1.7_2.5 Test requirement 465
5.1.8 E-UTRAN TDD-FDD Handover inter frequency case 467
5.1.8.1 Test purpose 467
5.1.8.2 Test applicability 467
5.1.8.3 Minimum conformance requirements 467
5.1.8.4 Test description 467
5.1.8.4.1 Initial conditions 467
5.1.8.4.2 Test procedure 468
5.1.8.4.3 Message contents 469
5.1.8.5 Test requirement 470
5.1.8_2 E-UTRAN TDD – FDD Inter frequency handover for UE Category 1bis 473
5.1.8_2.1 Test purpose 473
5.1.8_2.2 Test applicability 473
5.1.8_2.3 Minimum conformance requirements 473
5.1.8_2.4 Test description 473
5.1.8_2.4.1 Initial conditions 473
5.1.8_2.4.2 Test procedure 474
5.1.8_2.4.3 Message contents 474
5.1.8_2.5 Test requirement 474
5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth 477
5.1.9.1 Test purpose 477
5.1.9.2 Test applicability 477
5.1.9.3 Minimum conformance requirements 477
5.1.9.4 Test description 477
5.1.9.4.1 Initial conditions 477
5.1.9.4.2 Test procedure 477
5.1.9.4.3 Message contents 477
5.1.9.5 Test requirement 478
5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0 478
5.1.10.1 Test purpose 478
5.1.10.2 Test applicability 478
5.1.10.3 Minimum conformance requirements 478
5.1.10.4 Test description 479
5.1.10.4.1 Initial conditions 479
5.1.10.4.2 Test procedure 480
5.1.10.4.3 Message contents 480
5.1.10.5 Test requirement 480
5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0 482
5.1.11.1 Test purpose 482
5.1.11.2 Test applicability 482
5.1.11.3 Minimum conformance requirements 482
5.1.11.4 Test description 482
5.1.11.4.1 Initial conditions 482
5.1.11.4.2 Test procedure 483
5.1.11.4.3 Message contents 484
5.1.11.5 Test requirement 484
5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0 486
5.1.12.1 Test purpose 486

5.1.12.2 Test applicability 486
5.1.12.3 Minimum conformance requirements 486
5.1.12.4 Test description 486
5.1.12.4.1 Initial conditions 486
5.1.12.4.2 Test procedure 487
5.1.12.4.3 Message contents 488
5.1.12.5 Test requirement 488
5.1.13 E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA 490
5.1.13.1 Test purpose 490
5.1.13.2 Test applicability 490
5.1.13.3 Minimum conformance requirements 490
5.1.13.4 Test description 491
5.1.13.4.1 Initial conditions 491
5.1.13.4.2 Test procedure 491
5.1.13.4.3 Message contents 492
5.1.13.5 Test requirement 496
5.1.14 E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA 498
5.1.14.1 Test purpose 498
5.1.14.2 Test applicability 498
5.1.14.3 Minimum conformance requirements 498
5.1.14.4 Test description 499
5.1.14.4.1 Initial conditions 499
5.1.14.4.2 Test procedure 499
5.1.14.4.3 Message contents 500
5.1.14.5 Test requirement 500
5.1.15 E-UTRAN TDD Intra frequency handover for CE UEs in CEModeA 502
5.1.15.1 Test purpose 502
5.1.15.2 Test applicability 502
5.1.15.3 Minimum conformance requirements 502
5.1.15.4 Test description 503
5.1.15.4.1 Initial conditions 503
5.1.15.4.2 Test procedure 503
5.1.15.4.3 Message contents 504
5.1.15.5 Test requirement 508
5.1.16 E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeB 510
5.1.16.1 Test purpose 510
5.1.16.2 Test applicability 510
5.1.16.3 Minimum conformance requirements 510
5.1.16.4 Test description 511
5.1.16.4.1 Initial conditions 511
5.1.16.4.2 Test procedure 511
5.1.16.4.3 Message contents 512
5.1.16.5 Test requirement 512
5.1.17 E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeB 514
5.1.17.1 Test purpose 514
5.1.17.2 Test applicability 514
5.1.17.3 Minimum conformance requirements 514
5.1.17.4 Test description 515
5.1.17.4.1 Initial conditions 515
5.1.17.4.2 Test procedure 515
5.1.17.4.3 Message contents 516
5.1.17.5 Test requirement 516
5.1.18 E-UTRAN TDD Intra frequency handover for CE UEs in CEModeB 518
5.1.18.1 Test purpose 518
5.1.18.2 Test applicability 518
5.1.18.3 Minimum conformance requirements 518
5.1.18.4 Test description 519
5.1.18.4.1 Initial conditions 519
5.1.18.4.2 Test procedure 519
5.1.18.4.3 Message contents 520
5.1.18.5 Test requirement 520
5.1.19 E-UTRAN FDD – FDD Intra frequency handover for UE Category 1bis 522

5.1.19.1 Test purpose 522
5.1.19.2 Test applicability 522
5.1.19.3 Minimum conformance requirements 522
5.1.19.4 Test description 523
5.1.19.4.1 Initial conditions 523
5.1.19.4.2 Test procedure 523
5.1.19.4.3 Message contents 524
5.1.19.5 Test requirement 524
5.1.20 E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis 526
5.1.20.1 Test purpose 526
5.1.20.2 Test applicability 526
5.1.20.3 Minimum conformance requirements 526
5.1.20.4 Test description 527
5.1.20.4.1 Initial conditions 527
5.1.20.4.2 Test procedure 527
5.1.20.4.3 Message contents 527
5.1.20.5 Test requirement 527
5.1.21 to 5.1.27 529
5.1.28 E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA 529
5.1.28.1 Test purpose 529
5.1.28.2 Test applicability 529
5.1.28.3 Minimum conformance requirements 529
5.1.28.4 Test description 530
5.1.28.4.1 Initial conditions 530
5.1.28.4.2 Test procedure 530
5.1.28.4.3 Message contents 531
5.1.28.5 Test requirement 535
5.1.29 to 5.1.33 537
5.1.34 E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA without SFN acquisition 537
5.1.34.1 Test purpose 537
5.1.34.2 Test applicability 537
5.1.34.3 Minimum conformance requirements 537
5.1.34.4 Test description 537
5.1.34.4.1 Initial conditions 537
5.1.34.4.2 Test procedure 538
5.1.34.4.3 Message contents 538
5.1.34.5 Test requirement 538
5.2 Handover from E-UTRAN to other RATs 540
5.2.1 E-UTRAN FDD - UTRAN FDD handover 540
5.2.1.1 Test purpose 540
5.2.1.2 Test applicability 540
5.2.1.3 Minimum conformance requirements 540
5.2.1.4 Test description 541
5.2.1.4.1 Initial conditions 541
5.2.1.4.2 Test procedure 542
5.2.1.4.3 Message contents 543
5.2.1.5 Test requirement 545
5.2.2 E-UTRAN TDD - UTRAN FDD handover 547
5.2.2.1 Test purpose 547
5.2.2.2 Test applicability 547
5.2.2.3 Minimum conformance requirements 547
5.2.2.4 Test description 548
5.2.2.4.1 Initial conditions 548
5.2.2.4.2 Test procedure 549
5.2.2.4.3 Message contents 550
5.2.2.5 Test requirement 552
5.2.3 E-UTRAN FDD - GSM handover 554
5.2.3.1 Test purpose 554
5.2.3.2 Test applicability 554
5.2.3.3 Minimum conformance requirements 554
5.2.3.4 Test description 555
5.2.3.4.1 Initial conditions 555

5.2.3.4.2 Test procedure 556
5.2.3.4.3 Message contents 557
5.2.3.5 Test requirement 558
5.2.4 E-UTRAN TDD - UTRAN TDD handover 559
5.2.4.1 Test purpose 559
5.2.4.2 Test applicability 559
5.2.4.3 Minimum conformance requirements 559
5.2.4.4 Test description 560
5.2.4.4.1 Initial conditions 560
5.2.4.4.2 Test procedure 561
5.2.4.4.3 Message contents 562
5.2.4.5 Test requirement 564
5.2.5 E-UTRAN FDD - UTRAN TDD handover 565
5.2.5.1 Test purpose 565
5.2.5.2 Test applicability 565
5.2.5.3 Minimum conformance requirements 566
5.2.5.3.1 void 566
5.2.5.3.2 1.28Mcps TDD option 566
5.2.5.3.2 void 566
5.2.5.4 Test description 566
5.2.5.4.1 void 566
5.2.5.4.2 1.28Mcps TDD option 566
5.2.5.4.3 7.68 Mcps TDD option 570
5.2.5.5 Test requirement 570
5.2.5.5.1 3.84Mcps TDD option 570
5.2.5.5.2 1.28Mcps TDD option 571
5.2.5.5.2 7.68 Mcps TDD option 572
5.2.6 E-UTRA TDD - GSM handover 572
5.2.6.1 Test purpose 572
5.2.6.2 Test applicability 572
5.2.6.3 Minimum conformance requirements 572
5.2.6.4 Test description 573
5.2.6.4.1 Initial conditions 573
5.2.6.4.2 Test procedure 574
5.2.6.4.3 Message contents 575
5.2.6.5 Test requirement 576
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell 578
5.2.7.1 Test purpose 578
5.2.7.2 Test applicability 578
5.2.7.3 Minimum conformance requirements 578
5.2.7.4 Test description 579
5.2.7.4.1 Initial conditions 579
5.2.7.4.2 Test procedure 579
5.2.7.4.3 Message contents 580
5.2.7.5 Test requirement 580
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell 582
5.2.8.1 Test purpose 582
5.2.8.2 Test applicability 582
5.2.8.3 Minimum conformance requirements 582
5.2.8.4 Test description 583
5.2.8.4.1 Initial conditions 583
5.2.8.4.2 Test procedure 584
5.2.8.4.3 Message contents 584
5.2.8.5 Test requirement 585
5.2.9 E-UTRAN TDD - GSM handover: unknown target cell 586
5.2.9.1 Test purpose 586
5.2.9.2 Test applicability 586
5.2.9.3 Minimum conformance requirements 586
5.2.9.4 Test description 587
5.2.9.4.1 Initial conditions 587
5.2.9.4.2 Test procedure 588
5.2.9.4.3 Message contents 588

5.2.9.5 Test requirement 589
5.2.10 E-UTRAN TDD - UTRAN TDD handover: unknown target cell 590
5.2.10.1 Test purpose 590
5.2.10.2 Test applicability 590
5.2.10.3 Minimum conformance requirements 590
5.2.10.4 Test description 591
5.2.10.4.1 Initial conditions 591
5.2.10.4.2 Test procedure 592
5.2.10.4.3 Message contents 593
5.2.10.5 Test requirement 593
5.2.11 E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth 595
5.2.11.1 Test purpose 595
5.2.11.2 Test applicability 595
5.2.11.3 Minimum conformance requirements 595
5.2.11.4 Test description 595
5.2.11.4.1 Initial conditions 595
5.2.11.4.2 Test procedure 596
5.2.11.4.3 Message contents 596
5.2.11.5 Test requirement 596
5.3 Handover from E-UTRAN to non-3GPP RATs 596
5.3.1 E-UTRAN FDD - HRPD handover 596
5.3.1.1 Test purpose 597
5.3.1.2 Test applicability 597
5.3.1.3 Minimum conformance requirements 597
5.3.1.4 Test description 597
5.3.1.4.1 Initial conditions 597
5.3.1.4.2 Test procedure 598
5.3.1.4.3 Message contents 599
5.3.1.5 Test requirement 605
5.3.2 E-UTRAN FDD - cdma2000 1xRTT handover 607
5.3.2.1 Test purpose 607
5.3.2.2 Test applicability 607
5.3.2.3 Minimum conformance requirements 607
5.3.2.4 Test description 608
5.3.2.4.1 Initial conditions 608
5.3.2.4.2 Test procedure 609
5.3.2.4.3 Message contents 610
5.3.2.5 Test requirement 610
5.3.3 E-UTRAN FDD - HRPD handover: unknown target cell 612
5.3.3.1 Test purpose 612
5.3.3.2 Test applicability 612
5.3.3.3 Minimum conformance requirements 612
5.3.3.4 Test description 613
5.3.3.4.1 Initial conditions 613
5.3.3.4.2 Test procedure 614
5.3.3.4.3 Message contents 615
5.3.3.5 Test requirement 615
5.3.4 E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell 616
5.3.4.1 Test purpose 616
5.3.4.2 Test applicability 617
5.3.4.3 Minimum conformance requirements 617
5.3.4.4 Test description 617
5.3.4.4.1 Initial conditions 617
5.3.4.4.2 Test procedure 618
5.3.4.4.3 Message contents 619
5.3.4.5 Test requirement 619
5.3.5 E-UTRAN TDD - HRPD handover 620
5.3.5.1 Test purpose 620
5.3.5.2 Test applicability 621
5.3.5.3 Minimum conformance requirements 621
5.3.5.4 Test description 621
5.3.5.4.1 Initial conditions 621

5.3.5.4.2 Test procedure 622
5.3.5.4.3 Message contents 623
5.3.5.5 Test requirement 633
5.3.6 E-UTRAN TDD - cdma2000 1xRTT handover 634
5.3.6.1 Test purpose 634
5.3.6.2 Test applicability 634
5.3.6.3 Minimum conformance requirements 635
5.3.6.4 Test description 635
5.3.6.4.1 Initial conditions 635
5.3.6.4.2 Test procedure 636
5.3.6.4.3 Message contents 637
5.3.6.5 Test requirement 646
6 RRC Connection Mobility Control 647
6.1 RRC Re-establishment 648
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment 648
6.1.1.1 Test purpose 648
6.1.1.2 Test applicability 648
6.1.1.3 Minimum conformance requirements 648
6.1.1.4 Test description 649
6.1.1.4.1 Initial conditions 649
6.1.1.4.2 Test procedure 649
6.1.1.4.3 Message contents 650
6.1.1.5 Test requirement 650
6.1.1_2 E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis 652
6.1.1_2.1 Test purpose 652
6.1.1_2.2 Test applicability 652
6.1.1_2.3 Minimum conformance requirements 652
6.1.1_2.4 Test description 652
6.1.1_2.4.1 Initial conditions 652
6.1.1_2.4.2 Test procedure 652
6.1.1_2.4.3 Message contents 652
6.1.1_2.5 Test requirement 652
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment 652
6.1.2.1 Test purpose 652
6.1.2.2 Test applicability 652
6.1.2.3 Minimum conformance requirements 653
6.1.2.4 Test description 653
6.1.2.4.1 Initial conditions 653
6.1.2.4.2 Test procedure 654
6.1.2.4.3 Message contents 655
6.1.2.5 Test requirement 655
6.1.2_2 E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis 657
6.1.2_2.1 Test purpose 657
6.1.2_2.2 Test applicability 657
6.1.2_2.3 Minimum conformance requirements 657
6.1.2_2.4 Test description 657
6.1.2_2.4.1 Initial conditions 657
6.1.2_2.4.2 Test procedure 657
6.1.2_2.4.3 Message contents 657
6.1.2_2.5 Test requirement 657
6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment 657
6.1.3.1 Test purpose 657
6.1.3.2 Test applicability 657
6.1.3.3 Minimum conformance requirements 658
6.1.3.4 Test description 658
6.1.3.4.1 Initial conditions 658
6.1.3.4.2 Test procedure 659
6.1.3.4.3 Message contents 660
6.1.3.5 Test requirement 660
6.1.3_2 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis 662
6.1.3_2.1 Test purpose 662

6.1.3_2.2 Test applicability 662
6.1.3_2.3 Minimum conformance requirements 662
6.1.3_2.4 Test description 662
6.1.3_2.4.1 Initial conditions 662
6.1.3_2.4.2 Test procedure 662
6.1.3_2.4.3 Message contents 662
6.1.3_2.5 Test requirement 662
6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment 662
6.1.4.1 Test purpose 662
6.1.4.2 Test applicability 662
6.1.4.3 Minimum conformance requirements 663
6.1.4.4 Test description 663
6.1.4.4.1 Initial conditions 663
6.1.4.4.2 Test procedure 664
6.1.4.4.3 Message contents 665
6.1.4.5 Test requirement 665
6.1.4_2 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis 667
6.1.4_2.1 Test purpose 667
6.1.4_2.2 Test applicability 667
6.1.4_2.3 Minimum conformance requirements 667
6.1.4_2.4 Test description 667
6.1.4_2.4.1 Initial conditions 667
6.1.4_2.4.2 Test procedure 667
6.1.4_2.4.3 Message contents 667
6.1.4_2.5 Test requirement 667
6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth 667
6.1.5.1 Test purpose 667
6.1.5.2 Test applicability 667
6.1.5.3 Minimum conformance requirements 668
6.1.5.4 Test description 668
6.1.5.4.1 Initial conditions 668
6.1.5.4.2 Test procedure 668
6.1.5.4.3 Message contents 668
6.1.5.5 Test requirement 668
6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0 669
6.1.6.1 Test purpose 669
6.1.6.2 Test applicability 669
6.1.6.3 Minimum conformance requirements 669
6.1.6.4 Test description 670
6.1.6.4.1 Initial conditions 670
6.1.6.4.2 Test procedure 670
6.1.6.4.3 Message contents 671
6.1.6.5 Test requirement 671
6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0 673
6.1.7.1 Test purpose 673
6.1.7.2 Test applicability 673
6.1.7.3 Minimum conformance requirements 673
6.1.7.4 Test description 673
6.1.7.4.1 Initial conditions 673
6.1.7.4.2 Test procedure 674
6.1.7.4.3 Message contents 675
6.1.7.5 Test requirement 675
6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0 677
6.1.8.1 Test purpose 677
6.1.8.2 Test applicability 677
6.1.8.3 Minimum conformance requirements 677
6.1.8.4 Test description 677
6.1.8.4.1 Initial conditions 677
6.1.8.4.2 Test procedure 678
6.1.8.4.3 Message contents 679
6.1.8.5 Test requirement 679
6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeA 681

6.1.9.1 Test purpose 681
6.1.9.2 Test applicability 681
6.1.9.3 Minimum conformance requirements 681
6.1.9.4 Test description 682
6.1.9.4.1 Initial conditions 682
6.1.9.4.2 Test procedure 682
6.1.9.4.3 Message contents 683
6.1.9.5 Test requirement 683
6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeA 685
6.1.10.1 Test purpose 685
6.1.10.2 Test applicability 685
6.1.10.3 Minimum conformance requirements 685
6.1.10.4 Test description 685
6.1.10.4.1 Initial conditions 685
6.1.10.4.2 Test procedure 686
6.1.10.4.3 Message contents 686
6.1.10.5 Test requirement 686
6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for CE UE in CEModeA 688
6.1.11.1 Test purpose 688
6.1.11.2 Test applicability 688
6.1.11.3 Minimum conformance requirements 688
6.1.11.4 Test description 688
6.1.11.4.1 Initial conditions 688
6.1.11.4.2 Test procedure 689
6.1.11.4.3 Message contents 689
6.1.11.5 Test requirement 689
6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeB 691
6.1.12.1 Test purpose 691
6.1.12.2 Test applicability 691
6.1.12.3 Minimum conformance requirements 691
6.1.12.4 Test description 692
6.1.12.4.1 Initial conditions 692
6.1.12.4.2 Test procedure 692
6.1.12.4.3 Message contents 693
6.1.12.5 Test requirement 693
6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeB 695
6.1.13.1 Test purpose 695
6.1.13.2 Test applicability 695
6.1.13.3 Minimum conformance requirements 695
6.1.13.4 Test description 695
6.1.13.4.1 Initial conditions 695
6.1.13.4.2 Test procedure 696
6.1.13.4.3 Message contents 696
6.1.13.5 Test requirement 696
6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for CE UE in CEModeB 698
6.1.14.1 Test purpose 698
6.1.14.2 Test applicability 698
6.1.14.3 Minimum conformance requirements 698
6.1.14.4 Test description 698
6.1.14.4.1 Initial conditions 698
6.1.14.4.2 Test procedure 699
6.1.14.4.3 Message contents 699
6.1.14.5 Test requirement 699
6.1.15 HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage 701
6.1.15.1 Test purpose 701
6.1.15.2 Test applicability 701
6.1.15.3 Minimum conformance requirements 701
6.1.15.4 Test description 702
6.1.15.4.1 Initial conditions 702
6.1.15.4.2 Test procedure 702
6.1.15.4.3 Message contents 703

6.1.15.5 Test requirement 703
6.1.16 HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage 706
6.1.16.1 Test purpose 706
6.1.16.2 Test applicability 706
6.1.16.3 Minimum conformance requirements 706
6.1.16.4 Test description 706
6.1.16.4.1 Initial conditions 706
6.1.16.4.2 Test procedure 707
6.1.16.4.3 Message contents 708
6.1.16.5 Test requirement 708
6.1.17 710
6.1.18 E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA 710
6.1.18.1 Test purpose 710
6.1.18.2 Test applicability 710
6.1.18.3 Minimum conformance requirements 710
6.1.18.4 Test description 710
6.1.18.4.1 Initial conditions 710
6.1.18.4.2 Test procedure 711
6.1.18.4.3 Message contents 711
6.1.18.5 Test requirement 712
6.1.23 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage 714
6.1.23.1 Test purpose 714
6.1.23.2 Test applicability 714
6.1.23.3 Minimum conformance requirements 714
6.1.23.4 Test description 714
6.1.23.4.1 Initial conditions 714
6.1.23.4.2 Test procedure 715
6.1.23.4.3 Message contents 715
6.1.23.5 Test requirement 715
6.1.24 E-UTRAN TDD - TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage 718
6.1.24.1 Test purpose 718
6.1.24.2 Test applicability 718
6.1.24.3 Minimum conformance requirements 718
6.1.24.4 Test description 718
6.1.24.4.1 Initial conditions 718
6.1.24.4.2 Test procedure 719
6.1.24.4.3 Message contents 719
6.1.24.5 Test requirement 719
6.2 Random Access 722
6.2.1 E-UTRAN FDD - Contention Based Random Access Test 722
6.2.1.1 Test purpose 722
6.2.1.2 Test applicability 722
6.2.1.3 Minimum conformance requirements 722
6.2.1.4 Test description 722
6.2.1.4.1 Initial conditions 722
6.2.1.4.2 Test procedure 723
6.2.1.4.3 Message contents 724
6.2.1.5 Test requirement 725
6.2.1_2 E-UTRAN FDD - Contention Based Random Access Test for UE Category 1bis 727
6.2.1_2.1 Test purpose 727
6.2.1_2.2 Test applicability 727
6.2.1_2.3 Minimum conformance requirements 727
6.2.1_2.4 Test description 727
6.2.1_2.4.1 Initial conditions 727
6.2.1_2.4.2 Test procedure 728
6.2.1_2.4.3 Message contents 728
6.2.1_2.5 Test requirement 728
6.2.2 E-UTRAN FDD - Non-Contention Based Random Access Test 728
6.2.2.1 Test purpose 728

6.2.2.2 Test applicability 728
6.2.2.3 Minimum conformance requirements 728
6.2.2.4 Test description 728
6.2.2.4.1 Initial conditions 728
6.2.2.4.2 Test procedure 729
6.2.2.4.3 Message contents 729
6.2.2.5 Test requirement 730
6.2.2_2 E-UTRAN FDD - Non-Contention Based Random Access Test for UE Category 1bis 732
6.2.2_2.1 Test purpose 732
6.2.2_2.2 Test applicability 732
6.2.2_2.3 Minimum conformance requirements 732
6.2.2_2.4 Test description 732
6.2.2_2.4.1 Initial conditions 732
6.2.2_2.4.2 Test procedure 733
6.2.2_2.4.3 Message contents 733
6.2.2_2.5 Test requirement 733
6.2.3 E-UTRAN TDD - Contention Based Random Access Test 733
6.2.3.1 Test purpose 733
6.2.3.2 Test applicability 733
6.2.3.3 Minimum conformance requirements 733
6.2.3.4 Test description 734
6.2.3.4.1 Initial conditions 734
6.2.3.4.2 Test procedure 734
6.2.3.4.3 Message contents 736
6.2.3.5 Test requirement 736
6.2.3_2 E-UTRAN TDD - Contention Based Random Access Test for UE Category 1bis 739
6.2.3_2.1 Test purpose 739
6.2.3_2.2 Test applicability 739
6.2.3_2.3 Minimum conformance requirements 739
6.2.3_2.4 Test description 739
6.2.3_2.4.1 Initial conditions 739
6.2.3_2.4.2 Test procedure 739
6.2.3_2.4.3 Message contents 739
6.2.3_2.5 Test requirement 739
6.2.4 E-UTRAN TDD - Non-Contention Based Random Access Test 740
6.2.4.1 Test purpose 740
6.2.4.2 Test applicability 740
6.2.4.3 Minimum conformance requirements 740
6.2.4.4 Test description 740
6.2.4.4.1 Initial conditions 740
6.2.4.4.2 Test procedure 740
6.2.4.4.3 Message contents 741
6.2.4.5 Test requirement 742
6.2.4_2 E-UTRAN TDD - Non-Contention Based Random Access Test for UE Category 1bis 744
6.2.4_2.1 Test purpose 744
6.2.4_2.2 Test applicability 744
6.2.4_2.3 Minimum conformance requirements 744
6.2.4_2.4 Test description 745
6.2.4_2.4.1 Initial conditions 745
6.2.4_2.4.2 Test procedure 745
6.2.4_2.4.3 Message contents 745
6.2.4_2.5 Test requirement 745
6.2.5 E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth 745
6.2.5.1 Test purpose 745
6.2.5.2 Test applicability 745
6.2.5.3 Minimum conformance requirements 745
6.2.5.4 Test description 745
6.2.5.4.1 Initial conditions 745
6.2.5.4.2 Test procedure 746
6.2.5.4.3 Message contents 746
6.2.5.5 Test requirement 746
6.2.6 E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth 746

6.2.6.1 Test purpose 746
6.2.6.2 Test applicability 746
6.2.6.3 Minimum conformance requirements 746
6.2.6.4 Test description 746
6.2.6.4.1 Initial conditions 746
6.2.6.4.2 Test procedure 747
6.2.6.4.3 Message contents 747
6.2.6.5 Test requirement 747
6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG 747
6.2.7.1 Test purpose 747
6.2.7.2 Test applicability 748
6.2.7.3 Minimum conformance requirements 748
6.2.7.4 Test description 748
6.2.7.4.1 Initial conditions 748
6.2.7.4.2 Test procedure 748
6.2.7.4.3 Message contents 750
6.2.7.5 Test requirement 752
6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG 754
6.2.8.1 Test purpose 754
6.2.8.2 Test applicability 754
6.2.8.3 Minimum conformance requirements 754
6.2.8.4 Test description 754
6.2.8.4.1 Initial conditions 754
6.2.8.4.2 Test procedure 755
6.2.8.4.3 Message contents 756
6.2.8.5 Test requirement 758
6.2.9 3DL/3UL TDD CA Non-Contention Based Random Access Test for 2 SCells 761
6.2.9.1 Test purpose 761
6.2.9.2 Test applicability 761
6.2.9.3 Minimum conformance requirements 761
6.2.9.4 Test description 761
6.2.9.4.1 Initial conditions 761
6.2.9.4.2 Test procedure 762
6.2.9.4.3 Message contents 763
6.2.9.5 Test requirement 765
6.2.10 E-UTRAN FDD - Contention based random access test for CE UEs in normal coverage 769
6.2.10.1 Test purpose 769
6.2.10.2 Test applicability 769
6.2.10.3 Minimum conformance requirements 770
6.2.10.4 Test description 771
6.2.10.4.1 Initial conditions 771
6.2.10.4.2 Test procedures 771
6.2.10.4.3 Message contents 773
6.2.10.5 Test requirement 776
6.2.11 E-UTRAN HD-FDD - Contention based random access test for CE UEs in normal coverage 779
6.2.11.1 Test purpose 779
6.2.11.2 Test applicability 779
6.2.11.3 Minimum conformance requirements 779
6.2.11.4 Test description 779
6.2.11.4.1 Initial conditions 779
6.2.11.4.2 Test procedures 780
6.2.11.4.3 Message contents 780
6.2.11.5 Test requirement 780
6.2.12 E-UTRAN TDD Contention Based Random Access Test for CE UEs in Normal Coverage 783
6.2.12.1 Test purpose 783
6.2.12.2 Test applicability 783
6.2.12.3 Minimum conformance requirements 783
6.2.12.4 Test description 783
6.2.12.4.1 Initial conditions 783
6.2.12.4.2 Test procedure 784
6.2.12.4.3 Message contents 784
6.2.12.5 Test requirement 784

6.2.13 E-UTRAN FDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage 787
6.2.13.1 Test purpose 787
6.2.13.2 Test applicability 787
6.2.13.3 Minimum conformance requirements 787
6.2.13.4 Test description 788
6.2.13.4.1 Initial conditions 788
6.2.13.4.2 Test procedures 788
6.2.13.4.3 Message contents 790
6.2.13.5 Test requirement 794
6.2.14 E-UTRAN HD-FDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage 796
6.2.14.1 Test purpose 796
6.2.14.2 Test applicability 796
6.2.14.3 Minimum conformance requirements 796
6.2.14.4 Test description 796
6.2.14.4.1 Initial conditions 796
6.2.14.4.2 Test procedures 797
6.2.14.4.3 Message contents 797
6.2.14.5 Test requirement 797
6.2.15 E-UTRAN TDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage 800
6.2.15.1 Test purpose 800
6.2.15.2 Test applicability 800
6.2.15.3 Minimum conformance requirements 800
6.2.15.4 Test description 800
6.2.15.4.1 Initial conditions 800
6.2.15.4.2 Test procedures 801
6.2.15.4.3 Message contents 801
6.2.15.5 Test requirement 801
6.2.16 Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage 804
6.2.16.1 Test purpose 804
6.2.16.2 Test applicability 804
6.2.16.3 Minimum conformance requirements 804
6.2.16.4 Test description 805
6.2.16.4.1 Initial conditions 805
6.2.16.4.2 Test procedure 805
6.2.16.4.3 Message contents 807
6.2.16.5 Test requirement 810
6.2.17 Contention Based Random Access Test for UE category NB1 UEs In-band mode in Enhanced Coverage 814
6.2.17.1 Test purpose 814
6.2.17.2 Test applicability 814
6.2.17.3 Minimum conformance requirements 814
6.2.17.4 Test description 814
6.2.17.4.1 Initial conditions 814
6.2.17.4.2 Test procedure 814
6.2.17.4.3 Message contents 816
6.2.17.5 Test requirement 819
6.2.18 Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage 823
6.2.18.1 Test purpose 823
6.2.18.2 Test applicability 823
6.2.18.3 Minimum conformance requirements 823
6.2.18.4 Test description 823
6.2.18.4.1 Initial conditions 823
6.2.18.4.2 Test procedure 823
6.2.18.4.3 Message contents 823
6.2.18.5 Test requirement 829
6.2.19 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage 832
6.2.19.1 Test purpose 832
6.2.19.2 Test applicability 832
6.2.19.3 Minimum conformance requirements 833

6.2.19.4 Test description 833
6.2.19.4.1 Initial conditions 833
6.2.19.4.2 Test procedure 834
6.2.19.4.3 Message contents 834
6.2.19.5 Test requirement 834
6.2.20 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in enhanced coverage 838
6.2.20.1 Test purpose 838
6.2.20.2 Test applicability 839
6.2.20.3 Minimum conformance requirements 839
6.2.20.4 Test description 839
6.2.20.4.1 Initial conditions 839
6.2.20.4.2 Test procedure 839
6.2.20.4.3 Message contents 839
6.2.20.5 Test requirement 839
6.2.21 TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage 843
6.3 RRC Connection Release with Redirection 853
6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD 853
6.3.1.1 Test purpose 853
6.3.1.2 Test applicability 853
6.3.1.3 Minimum conformance requirements 854
6.3.1.4 Test description 854
6.3.1.4.1 Initial conditions 854
6.3.1.4.2 Test procedure 855
6.3.1.4.3 Message contents 855
6.3.1.5 Test requirement 856
6.3.1_2 Redirection from E-UTRAN FDD to UTRAN FDD for UE Category 1bis 858
6.3.1_2.1 Test purpose 858
6.3.1_2.2 Test applicability 858
6.3.1_2.3 Minimum conformance requirements 858
6.3.1_2.4 Test description 858
6.3.1_2.4.1 Initial conditions 858
6.3.1_2.4.2 Test procedure 858
6.3.1_2.4.3 Message contents 858
6.3.1_2.5 Test requirement 859
6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD 859
6.3.2.1 Test purpose 859
6.3.2.2 Test applicability 859
6.3.2.3 Minimum conformance requirements 859
6.3.2.4 Test description 859
6.3.2.4.1 Initial conditions 859
6.3.2.4.2 Test procedure 860
6.3.2.4.3 Message contents 861
6.3.2.5 Test requirement 861
6.3.2_2 Redirection from E-UTRAN TDD to UTRAN FDD for UE Category 1bis 863
6.3.2_2.1 Test purpose 863
6.3.2_2.2 Test applicability 863
6.3.2_2.3 Minimum conformance requirements 863
6.3.2_2.4 Test description 863
6.3.2_2.4.1 Initial conditions 863
6.3.2_2.4.2 Test procedure 863
6.3.2_2.4.3 Message contents 863
6.3.2_2.5 Test requirement 864
6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided 864
6.3.3.1 Test Purpose 864
6.3.3.2 Test applicability 864
6.3.3.3 Minimum conformance requirements 864
6.3.3.4 Test description 864
6.3.3.4.1 Initial conditions 864
6.3.3.4.2 Test procedure 865
6.3.3.4.3 Message contents 865

6.3.3.5 Test requirement 866
6.3.3_2 Redirection from E-UTRAN FDD to GERAN when System Information is provided for UE Category 1bis 868
6.3.3_2.1 Test purpose 868
6.3.3_2.2 Test applicability 868
6.3.3_2.3 Minimum conformance requirements 868
6.3.3_2.4 Test description 868
6.3.3_2.4.1 Initial conditions 868
6.3.3_2.4.2 Test procedure 868
6.3.3_2.4.3 Message contents 868
6.3.3_2.5 Test requirement 868
6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided 868
6.3.4.1 Test Purpose 868
6.3.4.2 Test applicability 868
6.3.4.3 Minimum conformance requirements 869
6.3.4.4 Test description 869
6.3.4.4.1 Initial conditions 869
6.3.4.4.2 Test procedure 870
6.3.4.4.3 Message contents 870
6.3.4.5 Test requirement 871
6.3.4_2 Redirection from E-UTRAN TDD to GERAN when System Information is provided for UE Category 1bis 873
6.3.4_2.1 Test purpose 873
6.3.4_2.2 Test applicability 873
6.3.4_2.3 Minimum conformance requirements 873
6.3.4_2.4 Test description 873
6.3.4_2.4.1 Initial conditions 873
6.3.4_2.4.2 Test procedure 873
6.3.4_2.4.3 Message contents 873
6.3.4_2.5 Test requirement 873
6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD 873
6.3.5.1 Test purpose 873
6.3.5.2 Test applicability 873
6.3.5.3 Minimum conformance requirements 874
6.3.5.4 Test description 874
6.3.5.4.1 Initial conditions 874
6.3.5.4.2 Test procedure 875
6.3.5.4.3 Message contents 876
6.3.5.5 Test requirement 876
6.3.5_2 E-UTRA TDD RRC connection release redirection to UTRA TDD for UE Category 1bis 879
6.3.5_2.1 Test purpose 879
6.3.5_2.2 Test applicability 879
6.3.5_2.3 Minimum conformance requirements 879
6.3.5_2.4 Test description 879
6.3.5_2.4.1 Initial conditions 879
6.3.5_2.4.2 Test procedure 879
6.3.5_2.4.3 Message contents 879
6.3.5_2.5 Test requirement 880
6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD 880
6.3.6.1 Test purpose 880
6.3.6.2 Test applicability 880
6.3.6.3 Minimum conformance requirements 880
6.3.6.4 Test description 880
6.3.6.4.1 Initial conditions 880
6.3.6.4.2 Test procedure 881
6.3.6.4.3 Message contents 882
6.3.6.5 Test requirement 882
6.3.6_2 E-UTRA FDD RRC connection release redirection to UTRA TDD for UE Category 1bis 884
6.3.6_2.1 Test purpose 884
6.3.6_2.2 Test applicability 885
6.3.6_2.3 Minimum conformance requirements 885
6.3.6_2.4 Test description 885

6.3.6_2.4.1 Initial conditions 885
6.3.6_2.4.2 Test procedure 885
6.3.6_2.4.3 Message contents 885
6.3.6_2.5 Test requirement 885
6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided 885
6.3.7.1 Test purpose 885
6.3.7.2 Test applicability 885
6.3.7.3 Minimum conformance requirements 885
6.3.7.4 Test description 886
6.3.7.4.1 Initial conditions 886
6.3.7.4.2 Test procedure 887
6.3.7.4.3 Message contents 888
6.3.7.5 Test requirement 888
6.3.7_2 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis 890
6.3.7_2.1 Test purpose 890
6.3.7_2.2 Test applicability 890
6.3.7_2.3 Minimum conformance requirements 891
6.3.7_2.4 Test description 891
6.3.7_2.4.1 Initial conditions 891
6.3.7_2.4.2 Test procedure 891
6.3.7_2.4.3 Message contents 891
6.3.7_2.5 Test requirement 891
6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided 891
6.3.8.1 Test purpose 891
6.3.8.2 Test applicability 891
6.3.8.3 Minimum conformance requirements 891
6.3.8.4 Test description 892
6.3.8.4.1 Initial conditions 892
6.3.8.4.2 Test procedure 893
6.3.8.4.3 Message contents 893
6.3.8.5 Test requirement 894
6.3.8_2 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis 896
6.3.8_2.1 Test purpose 896
6.3.8_2.2 Test applicability 896
6.3.8_2.3 Minimum conformance requirements 897
6.3.8_2.4 Test description 897
6.3.8_2.4.1 Initial conditions 897
6.3.8_2.4.2 Test procedure 897
6.3.8_2.4.3 Message contents 897
6.3.8_2.5 Test requirement 897
6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information 897
6.3.9.1 Test purpose 897
6.3.9.2 Test applicability 897
6.3.9.3 Minimum conformance requirements 897
6.3.9.4 Test description 898
6.3.9.4.1 Initial conditions 898
6.3.9.4.2 Test procedure 899
6.3.9.4.3 Message contents 899
6.3.9.5 Test requirement 899
6.3.9_2 Redirection from E-UTRAN FDD to UTRAN FDD without System Information for UE Category 1bis 901
6.3.9_2.1 Test purpose 901
6.3.9_2.2 Test applicability 901
6.3.9_2.3 Minimum conformance requirements 901
6.3.9_2.4 Test description 901
6.3.9_2.4.1 Initial conditions 901
6.3.9_2.4.2 Test procedure 901
6.3.9_2.4.3 Message contents 901
6.3.9_2.5 Test requirement 902
6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided 902

6.3.10.1 Test Purpose 902
6.3.10.2 Test applicability 902
6.3.10.3 Minimum conformance requirements 902
6.3.10.4 Test description 902
6.3.10.4.1 Initial conditions 902
6.3.10.4.2 Test procedure 903
6.3.10.4.3 Message contents 904
6.3.10.5 Test requirement 904
6.3.10_2 Redirection from E-UTRAN FDD to GERAN when System Information is not provided for UE Category 1bis 906
6.3.10_2.1 Test purpose 906
6.3.10_2.2 Test applicability 906
6.3.10_2.3 Minimum conformance requirements 906
6.3.10_2.4 Test description 906
6.3.10_2.4.1 Initial conditions 906
6.3.10_2.4.2 Test procedure 906
6.3.10_2.4.3 Message contents 906
6.3.10_2.5 Test requirement 906
6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided 906
6.3.11.1 Test Purpose 906
6.3.11.2 Test applicability 906
6.3.11.3 Minimum conformance requirements 907
6.3.11.4 Test description 907
6.3.11.4.1 Initial conditions 907
6.3.11.4.2 Test procedure 908
6.3.11.4.3 Message contents 908
6.3.11.5 Test requirement 909
6.3.11_2 Redirection from E-UTRAN TDD to GERAN when System Information is not provided for UE Category 1bis 910
6.3.11_2.1 Test purpose 910
6.3.11_2.2 Test applicability 910
6.3.11_2.3 Minimum conformance requirements 910
6.3.11_2.4 Test description 910
6.3.11_2.4.1 Initial conditions 910
6.3.11_2.4.2 Test procedure 910
6.3.11_2.4.3 Message contents 911
6.3.11_2.5 Test requirement 911
6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided 911
6.3.12.1 Test purpose 911
6.3.12.2 Test applicability 911
6.3.12.3 Minimum conformance requirements 911
6.3.12.4 Test description 912
6.3.12.4.1 Initial conditions 912
6.3.12.4.2 Test procedure 912
6.3.12.4.3 Message contents 913
6.3.12.5 Test requirement 913
6.3.12_2 Redirection from E-UTRAN TDD to UTRAN FDD without System Information for UE Category 1bis 915
6.3.12_2.1 Test purpose 915
6.3.12_2.2 Test applicability 915
6.3.12_2.3 Minimum conformance requirements 915
6.3.12_2.4 Test description 915
6.3.12_2.4.1 Initial conditions 915
6.3.12_2.4.2 Test procedure 915
6.3.12_2.4.3 Message contents 915
6.3.12_2.5 Test requirement 915

7 Timing and Signalling Characteristics 916
7.1 UE Transmit Timing 916
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy 916
7.1.1.1 Test purpose 916
7.1.1.2 Test applicability 916

7.1.1.3 Minimum conformance requirements 916
7.1.1.4 Test description 917
7.1.1.4.1 Initial conditions 917
7.1.1.4.2 Test procedure 917
7.1.1.4.3 Message contents 918
7.1.1.5 Test requirement 921
7.1.1_1 E-UTRAN FDD - UE Transmit Timing Accuracy (Non DRx UE) 924
7.1.1_1.1 Test purpose 924
7.1.1_1.2 Test applicability 924
7.1.1_1.3 Minimum conformance requirements 924
7.1.1_1.4 Test description 925
7.1.1_1.4.1 Initial conditions 925
7.1.1_1.4.2 Test procedure 925
7.1.1_1.4.3 Message contents 925
7.1.1_1.5 Test requirement 926
7.1.1_2 E-UTRAN FDD - UE Transmit Timing Accuracy for UE category 1bis 929
7.1.1_2.1 Test purpose 929
7.1.1_2.2 Test applicability 929
7.1.1_2.3 Minimum conformance requirements 929
7.1.1_2.4 Test description 929
7.1.1_2.4.1 Initial conditions 929
7.1.1_2.4.2 Test procedure 929
7.1.1_2.4.3 Message contents 929
7.1.1_2.5 Test requirement 929
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy 929
7.1.2.1 Test purpose 929
7.1.2.2 Test applicability 930
7.1.2.3 Minimum conformance requirements 930
7.1.2.4 Test description 931
7.1.2.4.1 Initial conditions 931
7.1.2.4.2 Test procedure 931
7.1.2.4.3 Message contents 932
7.1.2.5 Test requirement 934
7.1.2_1 E-UTRAN TDD - UE Transmit Timing Accuracy (Non DRx UE) 937
7.1.2_1.1 Test purpose 937
7.1.2_1.2 Test applicability 937
7.1.2_1.3 Minimum conformance requirements 937
7.1.2_1.4 Test description 938
7.1.2_1.4.1 Initial conditions 938
7.1.2_1.4.2 Test procedure 938
7.1.2_1.4.3 Message contents 938
7.1.2_1.5 Test requirement 939
7.1.2_2 E-UTRAN TDD - UE Transmit Timing Accuracy for UE category 1bis 942
7.1.2_2.1 Test purpose 942
7.1.2_2.2 Test applicability 942
7.1.2_2.3 Minimum conformance requirements 942
7.1.2_2.4 Test description 942
7.1.2_2.4.1 Initial conditions 942
7.1.2_2.4.2 Test procedure 942
7.1.2_2.4.3 Message contents 943
7.1.2_2.5 Test requirement 945
7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell 948
7.1.3.1 Test purpose 948
7.1.3.2 Test applicability 948
7.1.3.3 Minimum conformance requirements 949
7.1.3.4 Test description 949
7.1.3.4.1 Initial conditions 949
7.1.3.4.2 Test procedure 950
7.1.3.4.3 Message contents 950
7.1.3.5 Test requirement 953
7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward) 955
7.1.3_1.1 Test purpose 955

7.1.3_1.2 Test applicability 955
7.1.3_1.3 Minimum conformance requirements 955
7.1.3_1.4 Test description 956
7.1.3_1.4.1 Initial conditions 956
7.1.3_1.4.2 Test procedure 956
7.1.3_1.4.3 Message contents 957
7.1.3_1.5 Test requirement 959
7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell 962
7.1.4.1 Test purpose 962
7.1.4.2 Test applicability 962
7.1.4.3 Minimum conformance requirements 962
7.1.4.4 Test description 963
7.1.4.4.1 Initial conditions 963
7.1.4.4.2 Test procedure 963
7.1.4.4.3 Message contents 964
7.1.4.5 Test requirement 966
7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward) 969
7.1.4_1.1 Test purpose 969
7.1.4_1.2 Test applicability 969
7.1.4_1.3 Minimum conformance requirements 969
7.1.4_1.4 Test description 970
7.1.4_1.4.1 Initial conditions 970
7.1.4_1.4.2 Test procedure 970
7.1.4_1.4.3 Message contents 971
7.1.4_1.5 Test requirement 973
7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth 976
7.1.4A.1 Test purpose 976
7.1.4A.2 Test applicability 976
7.1.4A.3 Minimum conformance requirements 976
7.1.4A.4 Test description 976
7.1.4A.4.1 Initial conditions 976
7.1.4A.4.2 Test procedure 976
7.1.4A.4.3 Message contents 976
7.1.4A.5 Test requirement 976
7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth 978
7.1.5.1 Test purpose 978
7.1.5.2 Test applicability 978
7.1.5.3 Minimum conformance requirements 978
7.1.5.4 Test description 978
7.1.5.4.1 Initial conditions 978
7.1.5.4.2 Test procedure 979
7.1.5.4.3 Message contents 979
7.1.5.5 Test requirement 981
7.1.6 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG 983
7.1.6.1 Test purpose 983
7.1.6.2 Test applicability 983
7.1.6.3 Minimum conformance requirements 983
7.1.6.4 Test description 984
7.1.6.4.1 Initial conditions 984
7.1.6.4.2 Test procedure 984
7.1.6.4.3 Message contents 985
7.1.6.5 Test requirement 988
7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG 991
7.1.7.1 Test purpose 991
7.1.7.2 Test applicability 991
7.1.7.3 Minimum conformance requirements 991
7.1.7.4 Test description 992
7.1.7.4.1 Initial conditions 992
7.1.7.4.2 Test procedure 992
7.1.7.4.3 Message contents 993
7.1.7.5 Test requirement 993

7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth 996
7.1.7A.1 Test purpose 996
7.1.7A.2 Test applicability 996
7.1.7A.3 Minimum conformance requirements 996
7.1.7A.4 Test description 996
7.1.7A.4.1 Initial conditions 996
7.1.7A.4.2 Test procedure 996
7.1.7A.4.3 Message contents 996
7.1.7A.5 Test requirement 996
7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth 998
7.1.7B.1 Test purpose 998
7.1.7B.2 Test applicability 998
7.1.7B.3 Minimum conformance requirements 998
7.1.7B.4 Test description 998
7.1.7B.4.1 Initial conditions 998
7.1.7B.4.2 Test procedure 999
7.1.7B.4.3 Message contents 999
7.1.7B.5 Test requirement 999
7.1.8 Void 1001
7.1.9 Void 1001
7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA 1001
7.1.10.1 Test purpose 1001
7.1.10.2 Test applicability 1001
7.1.10.3 Minimum conformance requirements 1001
7.1.10.4 Test description 1002
7.1.10.4.1 Initial conditions 1002
7.1.10.4.2 Test procedure 1002
7.1.10.4.3 Message contents 1003
7.1.10.5 Test requirement 1005
7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA 1008
7.1.11.1 Test purpose 1008
7.1.11.2 Test applicability 1008
7.1.11.3 Minimum conformance requirements 1008
7.1.11.4 Test description 1009
7.1.11.4.1 Initial conditions 1009
7.1.11.4.2 Test procedure 1009
7.1.11.4.3 Message contents 1010
7.1.11.5 Test requirement 1012
7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA 1015
7.1.12.1 Test purpose 1015
7.1.12.2 Test applicability 1015
7.1.12.3 Minimum conformance requirements 1015
7.1.12.4 Test description 1016
7.1.12.4.1 Initial conditions 1016
7.1.12.4.2 Test procedure 1016
7.1.12.4.3 Message contents 1017
7.1.12.5 Test requirement 1019
7.1.13 3DL/3UL TDD CA UE Transmit Timing Accuracy Tests for 2 SCells 1022
7.1.13.1 Test purpose 1022
7.1.13.2 Test applicability 1022
7.1.13.3 Minimum conformance requirements 1022
7.1.13.4 Test description 1023
7.1.13.4.1 Initial conditions 1023
7.1.13.4.2 Test procedure 1023
7.1.13.4.3 Message contents 1024
7.1.13.5 Test requirement 1027
7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB 1030
7.1.14.1 Test purpose 1030
7.1.14.2 Test applicability 1030
7.1.14.3 Minimum conformance requirements 1030

7.1.14.4 Test description 1031
7.1.14.4.1 Initial conditions 1031
7.1.14.4.2 Test procedure 1031
7.1.14.4.3 Message contents 1032
7.1.14.5 Test requirement 1034
7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB 1037
7.1.15.1 Test purpose 1037
7.1.15.2 Test applicability 1037
7.1.15.3 Minimum conformance requirements 1037
7.1.15.4 Test description 1038
7.1.15.4.1 Initial conditions 1038
7.1.15.4.2 Test procedure 1038
7.1.15.4.3 Message contents 1039
7.1.15.5 Test requirement 1041
7.1.16 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB 1044
7.1.16.1 Test purpose 1044
7.1.16.2 Test applicability 1044
7.1.16.3 Minimum conformance requirements 1044
7.1.16.4 Test description 1045
7.1.16.4.1 Initial conditions 1045
7.1.16.4.2 Test procedure 1045
7.1.16.4.3 Message contents 1046
7.1.16.5 Test requirement 1047
7.1.17 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Normal Coverage 1050
7.1.17.1 Test purpose 1050
7.1.17.2 Test applicability 1050
7.1.17.3 Minimum conformance requirements 1050
7.1.17.4 Test description 1051
7.1.17.4.1 Initial conditions 1051
7.1.17.4.2 Test procedure 1051
7.1.17.4.3 Message contents 1052
7.1.17.5 Test requirement 1052
7.1.18 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Enhanced Coverage 1055
7.1.18.1 Test purpose 1055
7.1.18.2 Test applicability 1055
7.1.18.3 Minimum conformance requirements 1055
7.1.18.4 Test description 1055
7.1.18.4.1 Initial conditions 1055
7.1.18.4.2 Test procedure 1056
7.1.18.4.3 Message contents 1057
7.1.18.5 Test requirement 1058
7.1.21 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA 1061
7.1.21.1 Test purpose 1061
7.1.21.2 Test applicability 1061
7.1.21.3 Minimum conformance requirements 1061
7.1.21.4 Test description 1062
7.1.21.4.1 Initial conditions 1062
7.1.21.4.2 Test procedure 1062
7.1.21.4.3 Message contents 1063
7.1.21.5 Test requirement 1063
7.1.22 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA 1065
7.1.22.1 Test purpose 1065
7.1.22.2 Test applicability 1065
7.1.22.3 Minimum conformance requirements 1066
7.1.22.4 Test description 1066
7.1.22.4.1 Initial conditions 1066
7.1.22.4.2 Test procedure 1066
7.1.22.4.3 Message contents 1066
7.1.22.5 Test requirement 1066
7.1.23 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for CE UE in CEModeA 1069

7.1.23.1 Test purpose 1069
7.1.23.2 Test applicability 1069
7.1.23.3 Minimum conformance requirements 1069
7.1.23.4 Test description 1069
7.1.23.4.1 Initial conditions 1069
7.1.23.4.2 Test procedure 1069
7.1.23.4.3 Message contents 1070
7.1.23.5 Test requirement 1070
7.1.24 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeB 1073
7.1.24.1 Test purpose 1073
7.1.24.2 Test applicability 1073
7.1.24.3 Minimum conformance requirements 1073
7.1.24.4 Test description 1074
7.1.24.4.1 Initial conditions 1074
7.1.24.4.2 Test procedure 1074
7.1.24.4.3 Message contents 1075
7.1.24.5 Test requirement 1075
7.1.27 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage 1078
7.1.28 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage 1080
7.2 UE Timing Advance 1083
7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy 1083
7.2.1.1 Test purpose 1083
7.2.1.2 Test applicability 1084
7.2.1.3 Minimum conformance requirements 1084
7.2.1.4 Test description 1084
7.2.1.4.1 Initial conditions 1084
7.2.1.4.2 Test procedure 1085
7.2.1.4.3 Message contents 1086
7.2.1.5 Test requirement 1087
7.2.1_2 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy for UE category 1bis 1089
7.2.1_2.1 Test purpose 1089
7.2.1_2.2 Test applicability 1089
7.2.1_2.3 Minimum conformance requirements 1089
7.2.1_2.4 Test description 1089
7.2.1_2.4.1 Initial conditions 1089
7.2.1_2.4.2 Test procedure 1089
7.2.1_2.4.3 Message contents 1089
7.2.1_2.5 Test requirement 1089
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy 1089
7.2.2.1 Test purpose 1089
7.2.2.2 Test applicability 1089
7.2.2.3 Minimum conformance requirements 1089
7.2.2.4 Test description 1090
7.2.2.4.1 Initial conditions 1090
7.2.2.4.2 Test procedure 1090
7.2.2.4.3 Message contents 1091
7.2.2.5 Test requirement 1093
7.2.2_2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy for UE category 1bis 1094
7.2.2_2.1 Test purpose 1094
7.2.2_2.2 Test applicability 1094
7.2.2_2.3 Minimum conformance requirements 1094
7.2.2_2.4 Test description 1094
7.2.2_2.4.1 Initial conditions 1094
7.2.2_2.4.2 Test procedure 1094
7.2.2_2.4.3 Message contents 1094
7.2.2_2.5 Test requirement 1095
7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth 1095
7.2.3.1 Test purpose 1095
7.2.3.2 Test applicability 1095
7.2.3.3 Minimum conformance requirements 1095

7.2.3.4 Test description 1095
7.2.3.4.1 Initial conditions 1095
7.2.3.4.2 Test procedure 1095
7.2.3.4.3 Message contents 1096
7.2.3.5 Test requirement 1096
7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG 1096
7.2.4.1 Test purpose 1096
7.2.4.2 Test applicability 1096
7.2.4.3 Minimum conformance requirements 1096
7.2.4.4 Test description 1097
7.2.4.4.1 Initial conditions 1097
7.2.4.4.2 Test procedure 1097
7.2.4.4.3 Message contents 1098
7.2.4.5 Test requirement 1100
7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG 1102
7.2.5.1 Test purpose 1102
7.2.5.2 Test applicability 1102
7.2.5.3 Minimum conformance requirements 1102
7.2.5.4 Test description 1102
7.2.5.4.1 Initial conditions 1102
7.2.5.4.2 Test procedure 1103
7.2.5.4.3 Message contents 1104
7.2.5.5 Test requirement 1106
7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth 1108
7.2.5A.1 Test purpose 1108
7.2.5A.2 Test applicability 1108
7.2.5A.3 Minimum conformance requirements 1108
7.2.5A.4 Test description 1108
7.2.5A.4.1 Initial conditions 1108
7.2.5A.4.2 Test procedure 1108
7.2.5A.4.3 Message contents 1109
7.2.5A.5 Test requirement 1109
7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth 1109
7.2.5B.1 Test purpose 1109
7.2.5B.2 Test applicability 1109
7.2.5B.3 Minimum conformance requirements 1110
7.2.5B.4 Test description 1110
7.2.5B.4.1 Initial conditions 1110
7.2.5B.4.2 Test procedure 1110
7.2.5B.4.3 Message contents 1110
7.2.5B.5 Test requirement 1110
7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA 1111
7.2.6.1 Test purpose 1111
7.2.6.2 Test applicability 1111
7.2.6.3 Minimum conformance requirements 1111
7.2.6.4 Test description 1112
7.2.6.4.1 Initial conditions 1112
7.2.6.4.2 Test procedure 1112
7.2.6.4.3 Message contents 1113
7.2.6.5 Test requirement 1114
7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeA 1116
7.2.7.1 Test purpose 1116
7.2.7.2 Test applicability 1116
7.2.7.3 Minimum conformance requirements 1116
7.2.7.4 Test description 1116
7.2.7.4.1 Initial conditions 1116
7.2.7.4.2 Test procedure 1116
7.2.7.4.3 Message contents 1117
7.2.7.5 Test requirement 1117
7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA 1118

7.2.8.1 Test purpose 1118
7.2.8.2 Test applicability 1118
7.2.8.3 Minimum conformance requirements 1118
7.2.8.4 Test description 1118
7.2.8.4.1 Initial conditions 1118
7.2.8.4.2 Test procedure 1119
7.2.8.4.3 Message contents 1119
7.2.8.5 Test requirement 1119
7.2.9.2 Test applicability 1121
7.2.9.3 Minimum conformance requirements 1121
7.2.9.4 Test description 1121
7.2.9.4.1 Initial conditions 1121
7.2.9.4.2 Test procedure 1122
7.2.9.4.3 Message contents 1123
7.2.9.5 Test requirement 1124
7.2.10 E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB 1124
7.2.10.1 Test purpose 1124
7.2.10.2 Test applicability 1125
7.2.10.3 Minimum conformance requirements 1125
7.2.10.4 Test description 1125
7.2.10.4.1 Initial conditions 1125
7.2.10.4.2 Test procedure 1126
7.2.10.4.3 Message contents 1127
7.2.10.5 Test requirement 1128
7.2.11 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB 1129
7.2.11.1 Test purpose 1129
7.2.11.2 Test applicability 1129
7.2.11.3 Minimum conformance requirements 1129
7.2.11.4 Test description 1129
7.2.11.4.1 Initial conditions 1129
7.2.11.4.2 Test procedure 1129
7.2.11.4.3 Message contents 1130
7.2.11.5 Test requirement 1130
7.2.12 E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB 1131
7.2.12.1 Test purpose 1131
7.2.12.2 Test applicability 1131
7.2.12.3 Minimum conformance requirements 1131
7.2.12.4 Test description 1131
7.2.12.4.1 Initial conditions 1131
7.2.12.4.2 Test procedure 1131
7.2.12.4.3 Message contents 1132
7.2.12.5 Test requirement 1132
7.2.13 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for sTTI and ShortProcessingTime 1133
7.2.13.1 Test purpose 1133
7.2.13.2 Test applicability 1133
7.2.13.3 Minimum conformance requirements 1133
7.2.13.4 Test description 1133
7.2.13.4.1 Initial conditions 1133
7.2.13.4.2 Test procedure 1134
7.2.13.4.3 Message contents 1135
7.2.13.5 Test requirement 1137
7.2.14 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for sTTI and ShortProcessingTime 1138
7.2.14.1 Test purpose 1138
7.2.14.2 Test applicability 1138
7.2.14.3 Minimum conformance requirements 1138
7.2.14.4 Test description 1139
7.2.14.4.1 Initial conditions 1139
7.2.14.4.2 Test procedure 1140
7.2.14.4.3 Message contents 1141
7.2.14.5 Test requirement 1142

7.2.15 E-UTRAN TDD – TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage 1144
7.3 Radio Link Monitoring 1146
7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync 1146
7.3.1.1 Test purpose 1146
7.3.1.2 Test applicability 1146
7.3.1.3 Minimum conformance requirements 1147
7.3.1.4 Test description 1147
7.3.1.4.1 Initial conditions 1147
7.3.1.4.2 Test procedure 1149
7.3.1.4.3 Message contents 1149
7.3.1.5 Test requirement 1151
7.3.1_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports 1153
7.3.1_1.1 Test purpose 1153
7.3.1_1.2 Test applicability 1153
7.3.1_1.3 Minimum conformance requirements 1153
7.3.1_1.4 Test description 1153
7.3.1_1.4.1 Initial conditions 1153
7.3.1_1.4.2 Test procedure 1153
7.3.1_1.4.3 Message contents 1154
7.3.1_1.5 Test requirement 1154
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync 1156
7.3.2.1 Test purpose 1156
7.3.2.2 Test applicability 1156
7.3.2.3 Minimum conformance requirements 1156
7.3.2.4 Test description 1156
7.3.2.4.1 Initial conditions 1156
7.3.2.4.2 Test procedure 1159
7.3.2.4.3 Message contents 1159
7.3.2.5 Test requirement 1161
7.3.2_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports 1161
7.3.2_1.1 Test purpose 1161
7.3.2_1.2 Test applicability 1162
7.3.2_1.3 Minimum conformance requirements 1162
7.3.2_1.4 Test description 1162
7.3.2_1.4.1 Initial conditions 1162
7.3.2_1.4.2 Test procedure 1162
7.3.2_1.4.3 Message contents 1162
7.3.2_1.5 Test requirement 1163
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync 1164
7.3.3.1 Test purpose 1164
7.3.3.2 Test applicability 1164
7.3.3.3 Minimum conformance requirements 1164
7.3.3.4 Test description 1164
7.3.3.4.1 Initial conditions 1164
7.3.3.4.3 Message contents 1167
7.3.3.5 Test requirement 1169
7.3.3_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports 1171
7.3.3_1.1 Test purpose 1171
7.3.3_1.2 Test applicability 1171
7.3.3_1.3 Minimum conformance requirements 1171
7.3.3_1.4 Test description 1171
7.3.3_1.4.1 Initial conditions 1171
7.3.3_1.4.2 Test procedure 1171
7.3.3_1.4.3 Message contents 1172
7.3.3_1.5 Test requirement 1172
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync 1174
7.3.4.1 Test purpose 1174
7.3.4.2 Test applicability 1174
7.3.4.3 Minimum conformance requirements 1174
7.3.4.4 Test description 1174
7.3.4.4.1 Initial conditions 1174

7.3.4.4.2 Test procedure 1177
7.3.4.4.3 Message contents 1177
7.3.4.5 Test requirement 1179
7.3.4_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports 1180
7.3.4_1.1 Test purpose 1180
7.3.4_1.2 Test applicability 1180
7.3.4_1.3 Minimum conformance requirements 1180
7.3.4_1.4 Test description 1180
7.3.4_1.4.1 Initial conditions 1180
7.3.4_1.4.2 Test procedure 1180
7.3.4_1.4.3 Message contents 1180
7.3.4_1.5 Test requirement 1181
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX 1182
7.3.5.1 Test purpose 1182
7.3.5.2 Test applicability 1182
7.3.5.3 Minimum conformance requirements 1182
7.3.5.4 Test description 1182
7.3.5.4.1 Initial conditions 1183
7.3.5.4.2 Test procedure 1184
7.3.5.4.3 Message contents 1185
7.3.5.5 Test requirement 1189
7.3.5_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports 1190
7.3.5_1.1 Test purpose 1190
7.3.5_1.2 Test applicability 1190
7.3.5_1.3 Minimum conformance requirements 1190
7.3.5_1.4 Test description 1190
7.3.5_1.4.1 Initial conditions 1190
7.3.5_1.4.2 Test procedure 1191
7.3.5_1.4.3 Message contents 1191
7.3.5_1.5 Test requirement 1192
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX 1193
7.3.6.1 Test purpose 1193
7.3.6.2 Test applicability 1193
7.3.6.3 Minimum conformance requirements 1193
7.3.6.4 Test description 1194
7.3.6.4.1 Initial conditions 1194
7.3.6.4.2 Test procedure 1196
7.3.6.4.3 Message contents 1197
7.3.6.5 Test requirement 1199
7.3.6_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports 1200
7.3.6_1.1 Test purpose 1200
7.3.6_1.2 Test applicability 1200
7.3.6_1.3 Minimum conformance requirements 1200
7.3.6_1.4 Test description 1200
7.3.6_1.4.1 Initial conditions 1200
7.3.6_1.4.2 Test procedure 1200
7.3.6_1.4.3 Message contents 1201
7.3.6_1.5 Test requirement 1201
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX 1202
7.3.7.1 Test purpose 1202
7.3.7.2 Test applicability 1202
7.3.7.3 Minimum conformance requirements 1202
7.3.7.4 Test description 1203
7.3.7.4.1 Initial conditions 1203
7.3.7.4.2 Test procedure 1204
7.3.7.4.3 Message contents 1205
7.3.7.5 Test requirement 1209
7.3.7_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports 1210
7.3.7_1.1 Test purpose 1210
7.3.7_1.2 Test applicability 1210
7.3.7_1.3 Minimum conformance requirements 1210
7.3.7_1.4 Test description 1210

7.3.7_1.4.1 Initial conditions 1210
7.3.7_1.4.2 Test procedure 1211
7.3.7_1.4.3 Message contents 1211
7.3.7_1.5 Test requirement 1212
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX 1213
7.3.8.1 Test purpose 1213
7.3.8.2 Test applicability 1213
7.3.8.3 Minimum conformance requirements 1213
7.3.8.4 Test description 1214
7.3.8.4.1 Initial conditions 1214
7.3.8.4.2 Test procedure 1216
7.3.8.4.3 Message contents 1217
7.3.8.5 Test requirement 1219
7.3.8_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports 1220
7.3.8_1.1 Test purpose 1220
7.3.8_1.2 Test applicability 1220
7.3.8_1.3 Minimum conformance requirements 1220
7.3.8_1.4 Test description 1220
7.3.8_1.4.1 Initial conditions 1220
7.3.8_1.4.2 Test procedure 1221
7.3.8_1.4.3 Message contents 1221
7.3.8_1.5 Test requirement 1222
7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC) 1223
7.3.9.1 Test purpose 1223
7.3.9.2 Test applicability 1223
7.3.9.3 Minimum conformance requirements 1223
7.3.9.4 Test description 1223
7.3.9.4.1 Initial conditions 1224
7.3.9.4.2 Test procedure 1226
7.3.9.4.3 Message contents 1226
7.3.9.5 Test requirements 1228
7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC) 1229
7.3.10.1 Test purpose 1229
7.3.10.2 Test applicability 1229
7.3.10.3 Minimum conformance requirements 1229
7.3.10.4 Test description 1229
7.3.10.4.1 Initial conditions 1230
7.3.10.4.2 Test procedure 1232
7.3.10.4.3 Message contents 1232
7.3.10.5 Test requirements 1235
7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC) 1236
7.3.11.1 Test purpose 1236
7.3.11.2 Test applicability 1236
7.3.11.3 Minimum conformance requirements 1236
7.3.11.4 Test description 1236
7.3.11.4.1 Initial conditions 1237
7.3.11.4.2 Test procedure 1239
7.3.11.4.3 Message contents 1239
7.3.11.5 Test requirements 1241
7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC) 1242
7.3.12.1 Test purpose 1242
7.3.12.2 Test applicability 1242
7.3.12.3 Minimum conformance requirements 1242
7.3.12.4 Test description 1242
7.3.12.4.1 Initial conditions 1243
7.3.12.4.2 Test procedure 1245
7.3.12.4.3 Message contents 1245
7.3.12.5 Test requirements 1248

7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 1249
7.3.13.1 Test purpose 1249
7.3.13.2 Test applicability 1249
7.3.13.3 Minimum conformance requirements 1249
7.3.13.4 Test description 1249
7.3.13.4.1 Initial conditions 1250
7.3.13.4.2 Test procedure 1252
7.3.13.4.3 Message contents 1252
7.3.13.5 Test requirements 1255
7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 1256
7.3.14.1 Test purpose 1256
7.3.14.2 Test applicability 1256
7.3.14.3 Minimum conformance requirements 1256
7.3.14.4 Test description 1256
7.3.14.4.1 Initial conditions 1257
7.3.14.4.2 Test procedure 1259
7.3.14.4.3 Message contents 1259
7.3.14.5 Test requirements 1262
7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 1263
7.3.15.1 Test purpose 1263
7.3.15.2 Test applicability 1263
7.3.15.3 Minimum conformance requirements 1263
7.3.15.4 Test description 1263
7.3.15.4.1 Initial conditions 1264
7.3.15.4.2 Test procedure 1266
7.3.15.4.3 Message contents 1266
7.3.15.5 Test requirements 1269
7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 1270
7.3.16.1 Test purpose 1270
7.3.16.2 Test applicability 1270
7.3.16.3 Minimum conformance requirements 1270
7.3.16.4 Test description 1270
7.3.16.4.1 Initial conditions 1271
7.3.16.4.2 Test procedure 1273
7.3.16.4.3 Message contents 1273
7.3.16.5 Test requirements 1276
7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) 1277
7.3.17.1 Test purpose 1277
7.3.17.2 Test applicability 1277
7.3.17.3 Minimum conformance requirements 1277
7.3.17.4 Test description 1277
7.3.17.4.1 Initial conditions 1278
7.3.17.4.2 Test procedure 1280
7.3.17.4.3 Message contents 1280
7.3.17.5 Test requirements 1284
7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) 1285
7.3.18.1 Test purpose 1285
7.3.18.2 Test applicability 1285
7.3.18.3 Minimum conformance requirements 1285
7.3.18.4 Test description 1285
7.3.18.4.1 Initial conditions 1286
7.3.18.4.2 Test procedure 1288
7.3.18.4.3 Message contents 1288
7.3.18.5 Test requirements 1292
7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) 1293

7.3.19.1 Test purpose 1293
7.3.19.2 Test applicability 1293
7.3.19.3 Minimum conformance requirements 1293
7.3.19.4 Test description 1293
7.3.19.4.1 Initial conditions 1294
7.3.19.4.2 Test procedure 1296
7.3.19.4.3 Message contents 1297
7.3.19.5 Test requirements 1301
7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) 1302
7.3.20.1 Test purpose 1302
7.3.20.2 Test applicability 1302
7.3.20.3 Minimum conformance requirements 1302
7.3.20.4 Test description 1302
7.3.20.4.1 Initial conditions 1303
7.3.20.4.2 Test procedure 1305
7.3.20.4.3 Message contents 1306
7.3.20.5 Test requirements 1310
7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC) 1311
7.3.21.1 Test purpose 1311
7.3.21.2 Test applicability 1311
7.3.21.3 Minimum conformance requirements 1311
7.3.21.4 Test description 1311
7.3.21.4.1 Initial conditions 1312
7.3.21.4.2 Test procedure 1314
7.3.21.4.3 Message contents 1315
7.3.21.5 Test requirements 1319
7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC) 1320
7.3.22.1 Test purpose 1320
7.3.22.2 Test applicability 1320
7.3.22.3 Minimum conformance requirements 1320
7.3.22.4 Test description 1320
7.3.22.4.1 Initial conditions 1321
7.3.22.4.2 Test procedure 1323
7.3.22.4.3 Message contents 1323
7.3.22.5 Test requirements 1327
7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth 1328
7.3.23.1 Test purpose 1328
7.3.23.2 Test applicability 1328
7.3.23.3 Minimum conformance requirements 1328
7.3.23.4 Test description 1328
7.3.23.4.1 Initial conditions 1328
7.3.23.4.2 Test procedure 1329
7.3.23.4.3 Message contents 1330
7.3.23.5 Test requirement 1331
7.3.23_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth with 4 Rx antenna ports 1331
7.3.23_1.1 Test purpose 1331
7.3.23_1.2 Test applicability 1331
7.3.23_1.3 Minimum conformance requirements 1331
7.3.23_1.4 Test description 1331
7.3.23_1.4.1 Initial conditions 1331
7.3.23_1.4.2 Test procedure 1332
7.3.23_1.4.3 Message contents 1332
7.3.23_1.5 Test requirement 1332
7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth 1332
7.3.24.1 Test purpose 1332
7.3.24.2 Test applicability 1332
7.3.24.3 Minimum conformance requirements 1332
7.3.24.4 Test description 1332

7.3.24.4.1 Initial conditions 1333
7.3.24.4.2 Test procedure 1334
7.3.24.4.3 Message contents 1334
7.3.24.5 Test requirement 1334
7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth 1335
7.3.25.1 Test purpose 1335
7.3.25.2 Test applicability 1335
7.3.25.3 Minimum conformance requirements 1335
7.3.25.4 Test description 1335
7.3.25.4.1 Initial conditions 1335
7.3.25.4.2 Test procedure 1336
7.3.25.4.3 Message contents 1336
7.3.25.5 Test requirement 1336
7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0 1337
7.3.26.1 Test purpose 1337
7.3.26.2 Test applicability 1337
7.3.26.3 Minimum conformance requirements 1337
7.3.26.4 Test description 1337
7.3.26.4.1 Initial conditions 1338
7.3.26.4.2 Test procedure 1339
7.3.26.4.3 Message contents 1340
7.3.26.5 Test requirement 1341
7.3.26_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis 1342
7.3.26_2.1 Test purpose 1342
7.3.26_2.2 Test applicability 1342
7.3.26_2.3 Minimum conformance requirements 1342
7.3.26_2.4 Test description 1342
7.3.26_2.4.1 Initial conditions 1342
7.3.26_2.4.2 Test procedure 1342
7.3.26_2.4.3 Message contents 1343
7.3.26_2.5 Test requirement 1343
7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0 1344
7.3.27.1 Test purpose 1344
7.3.27.2 Test applicability 1344
7.3.27.3 Minimum conformance requirements 1344
7.3.27.4 Test description 1344
7.3.27.4.1 Initial conditions 1345
7.3.27.4.2 Test procedure 1346
7.3.27.4.3 Message contents 1347
7.3.27.5 Test requirement 1349
7.3.27_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 1bis 1350
7.3.27_2.1 Test purpose 1350
7.3.27_2.2 Test applicability 1350
7.3.27_2.3 Minimum conformance requirements 1350
7.3.27_2.4 Test description 1350
7.3.27_2.4.1 Initial conditions 1350
7.3.27_2.4.2 Test procedure 1350
7.3.27_2.4.3 Message contents 1350
7.3.27_2.5 Test requirement 1351
7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0 1352
7.3.28.1 Test purpose 1352
7.3.28.2 Test applicability 1352
7.3.28.3 Minimum conformance requirements 1352
7.3.28.4 Test description 1352
7.3.28.4.1 Initial conditions 1353
7.3.28.4.2 Test procedure 1354
7.3.28.4.3 Message contents 1355
7.3.28.5 Test requirement 1357
7.3.28_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis 1358
7.3.28_2.1 Test purpose 1358
7.3.28_2.2 Test applicability 1358
7.3.28_2.3 Minimum conformance requirements 1358

7.3.28_2.4 Test description 1358
7.3.28_2.4.1 Initial conditions 1359
7.3.28_2.4.2 Test procedure 1359
7.3.28_2.4.3 Message contents 1359
7.3.28_2.5 Test requirement 1359
7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0 1361
7.3.29.1 Test purpose 1361
7.3.29.2 Test applicability 1361
7.3.29.3 Minimum conformance requirements 1361
7.3.29.4 Test description 1362
7.3.29.4.1 Initial conditions 1362
7.3.29.4.2 Test procedure 1363
7.3.29.4.3 Message contents 1364
7.3.29.5 Test requirement 1366
7.3.29_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis 1367
7.3.29_2.1 Test purpose 1367
7.3.29_2.2 Test applicability 1367
7.3.29_2.3 Minimum conformance requirements 1367
7.3.29_2.4 Test description 1367
7.3.29_2.4.1 Initial conditions 1368
7.3.29_2.4.2 Test procedure 1368
7.3.29_2.4.3 Message contents 1368
7.3.29_2.5 Test requirement 1368
7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0 1370
7.3.30.1 Test purpose 1370
7.3.30.2 Test applicability 1370
7.3.30.3 Minimum conformance requirements 1370
7.3.30.4 Test description 1370
7.3.30.4.1 Initial conditions 1371
7.3.30.4.2 Test procedure 1372
7.3.30.4.3 Message contents 1373
7.3.30.5 Test requirement 1374
7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0 1375
7.3.31.1 Test purpose 1375
7.3.31.2 Test applicability 1375
7.3.31.3 Minimum conformance requirements 1375
7.3.31.4 Test description 1375
7.3.31.4.1 Initial conditions 1376
7.3.31.4.2 Test procedure 1377
7.3.31.4.3 Message contents 1378
7.3.31.5 Test requirement 1379
7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0 1380
7.3.32.1 Test purpose 1380
7.3.32.2 Test applicability 1381
7.3.32.3 Minimum conformance requirements 1381
7.3.32.4 Test description 1381
7.3.32.4.1 Initial conditions 1382
7.3.32.4.2 Test procedure 1383
7.3.32.4.3 Message contents 1384
7.3.32.5 Test requirement 1386
7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0 1387
7.3.33.1 Test purpose 1387
7.3.33.2 Test applicability 1387
7.3.33.3 Minimum conformance requirements 1387
7.3.33.4 Test description 1388
7.3.33.4.1 Initial conditions 1389
7.3.33.4.2 Test procedure 1390
7.3.33.4.3 Message contents 1390
7.3.33.5 Test requirement 1393
7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0 1394
7.3.34.1 Test purpose 1394
7.3.34.2 Test applicability 1394

7.3.34.3 Minimum conformance requirements 1394
7.3.34.4 Test description 1395
7.3.34.4.1 Initial conditions 1395
7.3.34.4.2 Test procedure 1396
7.3.34.4.3 Message contents 1397
7.3.34.5 Test requirement 1398
7.3.34_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis 1399
7.3.34_2.1 Test purpose 1399
7.3.34_2.2 Test applicability 1399
7.3.34_2.3 Minimum conformance requirements 1399
7.3.34_2.4 Test description 1399
7.3.34_2.4.1 Initial conditions 1399
7.3.34_2.4.2 Test procedure 1400
7.3.34_2.4.3 Message contents 1400
7.3.34_2.5 Test requirement 1400
7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0 1402
7.3.35.1 Test purpose 1402
7.3.35.2 Test applicability 1402
7.3.35.3 Minimum conformance requirements 1402
7.3.35.4 Test description 1402
7.3.35.4.1 Initial conditions 1403
7.3.35.4.2 Test procedure 1404
7.3.35.4.3 Message contents 1405
7.3.35.5 Test requirement 1407
7.3.35_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE Category 1bis 1408
7.3.35_2.1 Test purpose 1408
7.3.35_2.2 Test applicability 1408
7.3.35_2.3 Minimum conformance requirements 1408
7.3.35_2.4 Test description 1408
7.3.35_2.4.1 Initial conditions 1408
7.3.35_2.4.2 Test procedure 1408
7.3.35_2.4.3 Message contents 1408
7.3.35_2.5 Test requirement 1409
7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0 1410
7.3.36.1 Test purpose 1410
7.3.36.2 Test applicability 1410
7.3.36.3 Minimum conformance requirements 1410
7.3.36.4 Test description 1411
7.3.36.4.1 Initial conditions 1411
7.3.36.4.2 Test procedure 1412
7.3.36.4.3 Message contents 1413
7.3.36.5 Test requirement 1416
7.3.36_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis 1417
7.3.36_2.1 Test purpose 1417
7.3.36_2.2 Test applicability 1417
7.3.36_2.3 Minimum conformance requirements 1417
7.3.36_2.4 Test description 1417
7.3.36_2.4.1 Initial conditions 1417
7.3.36_2.4.2 Test procedure 1418
7.3.36_2.4.3 Message contents 1418
7.3.36_2.5 Test requirement 1418
7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0 1420
7.3.37.1 Test purpose 1420
7.3.37.2 Test applicability 1420
7.3.37.3 Minimum conformance requirements 1420
7.3.37.4 Test description 1421
7.3.37.4.1 Initial conditions 1421
7.3.37.4.2 Test procedure 1423
7.3.37.4.3 Message contents 1423
7.3.37.5 Test requirement 1426
7.3.37_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis 1427
7.3.37_2.1 Test purpose 1427

7.3.37_2.2 Test applicability 1427
7.3.37_2.3 Minimum conformance requirements 1427
7.3.37_2.4 Test description 1427
7.3.37_2.4.1 Initial conditions 1427
7.3.37_2.4.2 Test procedure 1428
7.3.37_2.4.3 Message contents 1428
7.3.37_2.5 Test requirement 1428
7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC 1430
7.3.38.1 Test purpose 1430
7.3.38.2 Test applicability 1430
7.3.38.3 Minimum conformance requirements 1430
7.3.38.4 Test description 1431
7.3.38.4.1 Initial conditions 1431
7.3.38.4.2 Test procedure 1432
7.3.38.4.3 Message contents 1433
7.3.38.5 Test requirement 1436
7.3.38_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with 4 Rx antenna ports 1437
7.3.38_1.1 Test purpose 1437
7.3.38_1.2 Test applicability 1437
7.3.38_1.3 Minimum conformance requirements 1437
7.3.38_1.4 Test description 1437
7.3.38_1.4.1 Initial conditions 1437
7.3.38_1.4.2 Test procedure 1438
7.3.38_1.4.3 Message contents 1438
7.3.38_1.5 Test requirement 1439
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC 1440
7.3.39.1 Test purpose 1440
7.3.39.2 Test applicability 1440
7.3.39.3 Minimum conformance requirements 1440
7.3.39.4 Test description 1441
7.3.39.4.1 Initial conditions 1442
7.3.39.4.2 Test procedure 1442
7.3.39.4.3 Message contents 1443
7.3.39.5 Test requirement 1444
7.3.39_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC with 4 Rx antenna ports 1445
7.3.39_1.1 Test purpose 1445
7.3.39_1.2 Test applicability 1445
7.3.39_1.3 Minimum conformance requirements 1445
7.3.39_1.4 Test description 1445
7.3.39_1.4.1 Initial conditions 1445
7.3.39_1.4.2 Test procedure 1446
7.3.39_1.4.3 Message contents 1446
7.3.39_1.5 Test requirement 1447
7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC 1448
7.3.40.1 Test purpose 1448
7.3.40.2 Test applicability 1448
7.3.40.3 Minimum conformance requirements 1448
7.3.40.4 Test description 1449
7.3.40.4.1 Initial conditions 1449
7.3.40.4.2 Test procedure 1450
7.3.40.4.3 Message contents 1451
7.3.40.5 Test requirement 1455
7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity 1456
7.3.41.1 Test purpose 1456
7.3.41.2 Test applicability 1456
7.3.41.3 Minimum conformance requirements 1456
7.3.41.4 Test description 1457
7.3.41.4.1 Initial conditions 1458

7.3.41.4.2 Test procedure 1459
7.3.41.4.3 Message contents 1460
7.3.41.5 Test requirement 1462
7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC 1464
7.3.42.1 Test purpose 1464
7.3.42.2 Test applicability 1464
7.3.42.3 Minimum conformance requirements 1464
7.3.42.4 Test description 1465
7.3.42.4.1 Initial conditions 1465
7.3.42.4.2 Test procedure 1467
7.3.42.4.3 Message contents 1467
7.3.42.5 Test requirement 1468
7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity 1469
7.3.43.1 Test purpose 1469
7.3.43.2 Test applicability 1469
7.3.43.3 Minimum conformance requirements 1469
7.3.43.4 Test description 1470
7.3.43.4.1 Initial conditions 1470
7.3.43.4.2 Test procedure 1472
7.3.43.4.3 Message contents 1473
7.3.43.5 Test requirement 1476
7.3.44 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD 1477
7.3.44.1 Test purpose 1477
7.3.44.2 Test applicability 1477
7.3.44.3 Minimum conformance requirements 1477
7.3.44.4 Test description 1478
7.3.44.4.1 Initial conditions 1478
7.3.44.4.2 Test procedure 1479
7.3.44.4.3 Message contents 1480
7.3.44.5 Test requirement 1483
7.3.45 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD 1484
7.3.45.1 Test purpose 1484
7.3.45.2 Test applicability 1484
7.3.45.3 Minimum conformance requirements 1484
7.3.45.4 Test description 1485
7.3.45.4.1 Initial conditions 1485
7.3.45.4.2 Test procedure 1486
7.3.45.4.3 Message contents 1487
7.3.45.5 Test requirement 1491
7.3.46 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD 1492
7.3.46.1 Test purpose 1492
7.3.46.2 Test applicability 1492
7.3.46.3 Minimum conformance requirements 1492
7.3.46.4 Test description 1493
7.3.46.4.1 Initial conditions 1493
7.3.46.4.2 Test procedure 1495
7.3.46.4.3 Message contents 1496
7.3.46.5 Test requirement 1499
7.3.47 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD 1500
7.3.47.1 Test purpose 1500
7.3.47.2 Test applicability 1500
7.3.47.3 Minimum conformance requirements 1500
7.3.47.4 Test description 1501
7.3.47.4.1 Initial conditions 1501
7.3.47.4.2 Test procedure 1503
7.3.47.4.3 Message contents 1504
7.3.47.5 Test requirement 1507

7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEMode A....1508
7.3.48.1 Test purpose....1508
7.3.48.2 Test applicability....1508
7.3.48.3 Minimum conformance requirements....1508
7.3.48.4 Test description....1509
7.3.48.4.1 Initial conditions....1509
7.3.48.4.2 Test procedure....1510
7.3.48.4.3 Message contents....1511
7.3.48.5 Test requirement....1512
7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for CE UE in CEModeA....1513
7.3.50 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA....1519
7.3.50.1 Test purpose....1519
7.3.50.2 Test applicability....1519
7.3.50.3 Minimum conformance requirements....1519
7.3.50.4 Test description....1520
7.3.50.4.1 Initial conditions....1520
7.3.50.4.2 Test procedure....1521
7.3.50.4.3 Message contents....1522
7.3.50.5 Test requirement....1524
7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEMode A....1525
7.3.51.1 Test purpose....1525
7.3.51.2 Test applicability....1525
7.3.51.3 Minimum conformance requirements....1525
7.3.51.4 Test description....1526
7.3.51.4.1 Initial conditions....1527
7.3.51.4.2 Test procedure....1528
7.3.51.4.3 Message contents....1528
7.3.51.5 Test requirement....1531
7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA....1532
7.3.52.1 Test purpose....1532
7.3.52.2 Test applicability....1532
7.3.52.3 Minimum conformance requirements....1532
7.3.52.4 Test description....1533
7.3.52.4.1 Initial conditions....1533
7.3.52.4.2 Test procedure....1534
7.3.52.4.3 Message contents....1535
7.3.52.5 Test requirement....1537
7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for CE UE in CEModeA....1538
7.3.53.1 Test purpose....1538
7.3.53.2 Test applicability....1538
7.3.53.3 Minimum conformance requirements....1538
7.3.53.4 Test description....1538
7.3.53.4.1 Initial conditions....1539
7.3.53.4.2 Test procedure....1540
7.3.53.4.3 Message contents....1541
7.3.53.5 Test requirement....1543
7.3.54 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEmodeA....1544
7.3.54.1 Test purpose....1544
7.3.54.2 Test applicability....1544
7.3.54.3 Minimum conformance requirements....1544
7.3.54.4 Test description....1545
7.3.54.4.1 Initial conditions....1546
7.3.54.4.2 Test procedure....1546
7.3.54.4.3 Message contents....1547
7.3.54.5 Test requirement....1550
7.3.55 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA....1551
7.3.55.1 Test purpose....1551
7.3.55.2 Test applicability....1551
7.3.55.3 Minimum conformance requirements....1551
7.3.55.4 Test description....1552
7.3.55.4.1 Initial conditions....1553
7.3.55.4.2 Test procedure....1554

7.3.55.4.3 Message contents 1555
7.3.55.5 Test requirement 1557
7.3.56 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA 1559
7.3.56.1 Test purpose 1559
7.3.56.2 Test applicability 1559
7.3.56.3 Minimum conformance requirements 1559
7.3.56.4 Test description 1559
7.3.56.4.1 Initial conditions 1560
7.3.56.4.2 Test procedure 1561
7.3.56.4.3 Message contents 1562
7.3.56.5 Test requirement 1564
7.3.57 E-UTRAN TDD Radio Link Monitoring Test for In-Sync for CE UE in CEModeA 1565
7.3.58 E- UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA 1571
7.3.58.1 Test purpose 1571
7.3.58.2 Test applicability 1571
7.3.58.3 Minimum conformance requirements 1571
7.3.58.4 Test description 1572
7.3.58.4.1 Initial conditions 1573
7.3.58.4.2 Test procedure 1573
7.3.58.4.3 Message contents 1574
7.3.58.5 Test requirement 1577
7.3.59 E- UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA 1578
7.3.59.1 Test purpose 1578
7.3.59.2 Test applicability 1578
7.3.59.3 Minimum conformance requirements 1578
7.3.59.4 Test description 1579
7.3.59.4.1 Initial conditions 1580
7.3.59.4.2 Test procedure 1581
7.3.59.4.3 Message contents 1582
7.3.59.5 Test requirement 1584
7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage 1585
7.3.60.1 Test purpose 1585
7.3.60.2 Test applicability 1585
7.3.60.3 Minimum conformance requirements 1585
7.3.60.4 Test description 1586
7.3.60.4.1 Initial conditions 1587
7.3.60.4.2 Test procedure 1589
7.3.60.4.3 Message contents 1589
7.3.60.5 Test requirement 1591
7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage 1593
7.3.61.1 Test purpose 1593
7.3.61.2 Test applicability 1593
7.3.61.3 Minimum conformance requirements 1593
7.3.61.4 Test description 1594
7.3.61.4.1 Initial conditions 1595
7.3.61.4.2 Test procedure 1597
7.3.61.4.3 Message contents 1597
7.3.61.5 Test requirement 1599
7.3.62 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Enhanced Coverage 1601
7.3.62.1 Test purpose 1601
7.3.62.2 Test applicability 1601
7.3.62.3 Minimum conformance requirements 1601
7.3.62.4 Test description 1601
7.3.62.4.1 Initial conditions 1602
7.3.62.4.2 Test procedure 1603
7.3.62.4.3 Message contents 1604
7.3.62.5 Test requirement 1605
7.3.63 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Normal Coverage 1607

7.3.63.1 Test purpose 1607
7.3.63.2 Test applicability 1607
7.3.63.3 Minimum conformance requirements 1607
7.3.63.4 Test description 1607
7.3.63.4.1 Initial conditions 1608
7.3.63.4.2 Test procedure 1609
7.3.63.4.3 Message contents 1610
7.3.63.5 Test requirement 1611
7.3.64 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage 1613
7.3.64.1 Test Purpose 1613
7.3.64.2 Test Applicability 1613
7.3.64.3 Minimum Conformance Requirements 1613
7.3.64.4 Test description 1613
7.3.64.4.1 Initial conditions 1614
7.3.64.4.2 Test procedure 1615
7.3.64.4.3 Message contents 1616
7.3.64.5 Test requirement 1617
7.3.65 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage 1618
7.3.65.1 Test Purpose 1618
7.3.65.2 Test Applicability 1618
7.3.65.3 Minimum Conformance Requirements 1619
7.3.65.4 Test description 1619
7.3.65.4.1 Initial conditions 1620
7.3.65.4.2 Test procedure 1621
7.3.65.4.3 Message contents 1622
7.3.65.5 Test requirement 1623
7.3.66 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 Standalone mode in Normal Coverage 1624
7.3.66.1 Test purpose 1624
7.3.66.2 Test applicability 1624
7.3.66.3 Minimum conformance requirements 1625
7.3.66.4 Test description 1625
7.3.66.4.1 Initial conditions 1626
7.3.66.4.2 Test procedure 1627
7.3.66.4.3 Message contents 1628
7.3.66.5 Test requirement 1629
7.3.67 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 guard band mode in Enhanced Coverage 1629
7.3.67.1 Test purpose 1629
7.3.67.2 Test applicability 1630
7.3.67.3 Minimum conformance requirements 1630
7.3.67.4 Test description 1630
7.3.67.4.1 Initial conditions 1630
7.3.67.4.2 Test procedure 1631
7.3.67.4.3 Message contents 1632
7.3.67.5 Test requirement 1633
7.3.68 1634
7.3.69 E-UTRAN HD-FDD Early Out-of-sync reporting Test for CE UE in CEMode A 1634
7.3.69.1 Test purpose 1634
7.3.69.2 Test applicability 1634
7.3.69.3 Minimum conformance requirements 1635
7.3.69.4 Test description 1636
7.3.69.4.1 Initial conditions 1636
7.3.69.4.2 Test procedure 1637
7.3.69.4.3 Message contents 1637
7.3.70 to 7.3.87 1640
7.3.88 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage 1640
7.3.89 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage 1643

7.4 Interruption for Dual Connectivity 1646
7.4.1 E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC 1646
7.4.1.1 Test purpose 1646
7.4.1.2 Test applicability 1646
7.4.1.3 Minimum conformance requirements 1646
7.4.1.4 Test description 1646
7.4.1.4.1 Initial conditions 1646
7.4.1.4.2 Test procedure 1647
7.4.1.4.3 Message contents 1648
7.4.1.5 Test requirement 1648
7.4.2 E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC 1650
7.4.2.1 Test purpose 1650
7.4.2.2 Test applicability 1650
7.4.2.3 Minimum conformance requirements 1650
7.4.2.4 Test description 1650
7.4.2.4.1 Initial conditions 1650
7.4.2.4.2 Test procedure 1651
7.4.2.4.3 Message contents 1652
7.4.2.5 Test requirement 1653
7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity 1654
7.4.3.1 Test Purpose 1654
7.4.3.2 Test Applicability 1654
7.4.3.3 Minimum Conformance Requirement 1655
7.4.3.4 Test Description 1655
7.4.3.4.1 Initial conditions 1655
7.4.3.4.2 Test procedure 1655
7.4.3.4.3 Message contents 1656
7.4.3.5 Test Requirement 1657
7.5 Proximity-based Services 1659
7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test 1659
7.5.1.1 Test purpose 1659
7.5.1.2 Test applicability 1659
7.5.1.3 Minimum conformance requirements 1659
7.5.1.4 Test description 1660
7.5.1.4.1 Initial conditions 1660
7.5.1.4.2 Test procedure 1660
7.5.1.4.3 Message contents 1660
7.5.1.5 Test requirement 1660
7.5.2 FFS 1662
7.5.3 E-UTRAN FDD – Interruptions due to ProSe Direct Discovery 1662
7.5.3.1 Test purpose 1662
7.5.3.2 Test applicability 1662
7.5.3.3 Minimum conformance requirements 1662
7.5.3.4 Test description 1664
7.5.3.4.1 Initial conditions 1664
7.5.3.4.2 Test procedure 1665
7.5.3.4.3 Message contents 1665
7.5.3.5 Test requirement 1665
7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test 1667
7.5.4.1 Test purpose 1667
7.5.4.2 Test applicability 1667
7.5.4.3 Minimum conformance requirements 1667
7.5.4.4 Test description 1667
7.5.4.4.1 Initial conditions 1667
7.5.4.4.2 Test procedure 1668
7.5.4.4.3 Message contents 1668
7.5.4.5 Test requirement 1668
7.6 Interruption for carrier aggregation 1670
7.6.1 E-UTRAN FDD-TDD CA interruption at SRS carrier based switching 1670

7.6.1.1 Test purpose 1670
7.6.1.2 Test applicability 1670
7.6.1.3 Minimum conformance requirements 1670
7.6.1.4 Test description 1670
7.6.1.4.1 Initial conditions 1670
7.6.1.4.2 Test procedure 1671
7.6.1.4.3 Message contents 1672
7.6.1.5 Test requirement 1673
7.6.2 E-UTRAN TDD-TDD CA interruption at SRS carrier based switching 1675
7.6.2.1 Test purpose 1675
7.6.2.2 Test applicability 1675
7.6.2.3 Minimum conformance requirements 1675
7.6.2.4 Test description 1675
7.6.2.4.1 Initial conditions 1675
7.6.2.4.2 Test procedure 1676
7.6.2.4.3 Message contents 1677
7.6.2.5 Test requirement 1678

8 UE Measurements Procedures 1681
8.1 E-UTRAN FDD intra frequency measurements 1681
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells 1681
8.1.1.1 Test purpose 1681
8.1.1.2 Test applicability 1681
8.1.1.3 Minimum conformance requirements 1681
8.1.1.4 Test description 1682
8.1.1.4.1 Initial conditions 1682
8.1.1.4.2 Test procedure 1683
8.1.1.4.3 Message contents 1684
8.1.1.5 Test requirement 1685
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells 1686
8.1.2.1 Test purpose 1686
8.1.2.2 Test applicability 1686
8.1.2.3 Minimum conformance requirements 1687
8.1.2.4 Test description 1688
8.1.2.4.1 Initial conditions 1688
8.1.2.4.2 Test procedure 1688
8.1.2.4.3 Message contents 1689
8.1.2.5 Test requirement 1691
8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX 1692
8.1.3.1 Test purpose 1692
8.1.3.2 Test applicability 1692
8.1.3.3 Minimum conformance requirements 1692
8.1.3.4 Test description 1693
8.1.3.4.1 Initial conditions 1693
8.1.3.4.2 Test procedure 1694
8.1.3.4.3 Message contents 1695
8.1.3.5 Test requirement 1697
8.1.4 Void 1700
8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 1700
8.1.5.1 Test purpose 1700
8.1.5.2 Test applicability 1700
8.1.5.3 Minimum conformance requirements 1700
8.1.5.4 Test description 1700
8.1.5.4.1 Initial conditions 1700
8.1.5.4.2 Test procedure 1701
8.1.5.4.3 Message contents 1702
8.1.5.5 Test requirement 1705

8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX 1707
8.1.6.1 Test purpose 1707
8.1.6.2 Test applicability 1707
8.1.6.3 Minimum conformance requirements 1707
8.1.6.4 Test description 1707
8.1.6.4.1 Initial conditions 1707
8.1.6.4.2 Test procedure 1708
8.1.6.4.3 Message contents 1709
8.1.6.5 Test requirement 1713
8.1.7 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) 1715
8.1.7.1 Test purpose 1715
8.1.7.2 Test applicability 1715
8.1.7.3 Minimum conformance requirements 1715
8.1.7.4 Test description 1716
8.1.7.4.1 Initial conditions 1716
8.1.7.4.2 Test procedure 1717
8.1.7.4.3 Message contents 1718
8.1.7.5 Test requirements 1721
8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 1722
8.1.8.1 Test purpose 1722
8.1.8.2 Test applicability 1722
8.1.8.3 Minimum conformance requirements 1722
8.1.8.4 Test description 1723
8.1.8.4.1 Initial conditions 1723
8.1.8.4.2 Test procedure 1726
8.1.8.4.3 Message contents 1726
8.1.8.5 Test requirements 1729
8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth 1731
8.1.9.1 Test purpose 1731
8.1.9.2 Test applicability 1731
8.1.9.3 Minimum conformance requirements 1731
8.1.9.4 Test description 1731
8.1.9.4.1 Initial conditions 1731
8.1.9.4.2 Test procedure 1732
8.1.9.4.3 Message contents 1732
8.1.9.5 Test requirement 1732
8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth 1732
8.1.10.1 Test purpose 1732
8.1.10.2 Test applicability 1732
8.1.10.3 Minimum conformance requirements 1733
8.1.10.4 Test description 1733
8.1.10.4.1 Initial conditions 1733
8.1.10.4.2 Test procedure 1733
8.1.10.4.3 Message contents 1733
8.1.10.5 Test requirement 1733
8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0 1734
8.1.11.1 Test purpose 1734
8.1.11.2 Test applicability 1734
8.1.11.3 Minimum conformance requirements 1734
8.1.11.4 Test description 1735
8.1.11.4.1 Initial conditions 1735
8.1.11.4.2 Test procedure 1736
8.1.11.4.3 Message contents 1737
8.1.11.5 Test requirement 1738

8.1.11_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis 1740
8.1.11_2.1 Test purpose 1740
8.1.11_2.2 Test applicability 1740
8.1.11_2.3 Minimum conformance requirements 1740
8.1.11_2.4 Test description 1741
8.1.11_2.4.1 Initial conditions 1741
8.1.11_2.4.2 Test procedure 1742
8.1.11_2.4.3 Message contents 1743
8.1.11_2.5 Test requirement 1744
8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0 1746
8.1.12.1 Test purpose 1746
8.1.12.2 Test applicability 1746
8.1.12.3 Minimum conformance requirements 1746
8.1.12.4 Test description 1747
8.1.12.4.1 Initial conditions 1747
8.1.12.4.2 Test procedure 1748
8.1.12.4.3 Message contents 1749
8.1.12.5 Test requirement 1750
8.1.12_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis 1752
8.1.12_2.1 Test purpose 1752
8.1.12_2.2 Test applicability 1752
8.1.12_2.3 Minimum conformance requirements 1752
8.1.12_2.4 Test description 1753
8.1.12_2.4.1 Initial conditions 1753
8.1.12_2.4.2 Test procedure 1754
8.1.12_2.4.3 Message contents 1755
8.1.12_2.5 Test requirement 1756
8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0 1758
8.1.13.1 Test purpose 1758
8.1.13.2 Test applicability 1758
8.1.13.3 Minimum conformance requirements 1758
8.1.13.4 Test description 1759
8.1.13.4.1 Initial conditions 1759
8.1.13.4.2 Test procedure 1760
8.1.13.4.3 Message contents 1761
8.1.13.5 Test requirement 1763
8.1.13_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis 1766
8.1.13_2.1 Test purpose 1766
8.1.13_2.2 Test applicability 1766
8.1.13_2.3 Minimum conformance requirements 1766
8.1.13_2.4 Test description 1767
8.1.13_2.4.1 Initial conditions 1767
8.1.13_2.4.2 Test procedure 1768
8.1.13_2.4.3 Message contents 1769
8.1.13_2.5 Test requirement 1771
8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0 1774
8.1.14.1 Test purpose 1774
8.1.14.2 Test applicability 1774
8.1.14.3 Minimum conformance requirements 1774
8.1.14.4 Test description 1775
8.1.14.4.1 Initial conditions 1775
8.1.14.4.2 Test procedure 1776
8.1.14.4.3 Message contents 1777
8.1.14.5 Test requirement 1778
8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0 1780

8.1.15.1 Test purpose 1780
8.1.15.2 Test applicability 1780
8.1.15.3 Minimum conformance requirements 1780
8.1.15.4 Test description 1781
8.1.15.4.1 Initial conditions 1781
8.1.15.4.2 Test procedure 1782
8.1.15.4.3 Message contents 1783
8.1.15.5 Test requirement 1784
8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0 1786
8.1.16.1 Test purpose 1786
8.1.16.2 Test applicability 1786
8.1.16.3 Minimum conformance requirements 1786
8.1.16.4 Test description 1787
8.1.16.4.1 Initial conditions 1787
8.1.16.4.2 Test procedure 1788
8.1.16.4.3 Message contents 1789
8.1.16.5 Test requirement 1791
8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0 1793
8.1.17.1 Test purpose 1793
8.1.17.2 Test applicability 1793
8.1.17.3 Minimum conformance requirements 1793
8.1.17.4 Test description 1794
8.1.17.4.1 Initial conditions 1794
8.1.17.4.2 Test procedure 1795
8.1.17.4.3 Message contents 1796
8.1.17.5 Test requirement 1797
8.1.17_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis 1799
8.1.17_2.1 Test purpose 1799
8.1.17_2.2 Test applicability 1799
8.1.17_2.3 Minimum conformance requirements 1799
8.1.17_2.4 Test description 1800
8.1.17_2.4.1 Initial conditions 1800
8.1.17_2.4.2 Test procedure 1801
8.1.17_2.4.3 Message contents 1802
8.1.17_2.5 Test requirement 1803
8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0 1805
8.1.18.1 Test purpose 1805
8.1.18.2 Test applicability 1805
8.1.18.3 Minimum conformance requirements 1805
8.1.18.4 Test description 1806
8.1.18.4.1 Initial conditions 1806
8.1.18.4.2 Test procedure 1807
8.1.18.4.3 Message contents 1808
8.1.18.5 Test requirement 1811
8.1.18_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis 1814
8.1.18_2.1 Test purpose 1814
8.1.18_2.2 Test applicability 1814
8.1.18_2.3 Minimum conformance requirements 1814
8.1.18_2.4 Test description 1815
8.1.18_2.4.1 Initial conditions 1815
8.1.18_2.4.2 Test procedure 1816
8.1.18_2.4.3 Message contents 1817
8.1.18_2.5 Test requirement 1820
8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 1823
8.1.19.1 Test purpose 1823
8.1.19.2 Test applicability 1823

8.1.19.3 Minimum conformance requirements 1823
8.1.19.4 Test description 1824
8.1.19.4.1 Initial conditions 1824
8.1.19.4.2 Test procedure 1824
8.1.19.4.3 Message contents 1825
8.1.19.5 Test requirement 1829
8.1.19_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis 1830
8.1.19_2.1 Test purpose 1830
8.1.19_2.2 Test applicability 1830
8.1.19_2.3 Minimum conformance requirements 1830
8.1.19_2.4 Test description 1831
8.1.19_2.4.1 Initial conditions 1831
8.1.19_2.5 Test requirement 1831
8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 1833
8.1.20.1 Test purpose 1833
8.1.20.2 Test applicability 1833
8.1.20.3 Minimum conformance requirements 1833
8.1.20.4 Test description 1834
8.1.20.4.1 Initial conditions 1834
8.1.20.4.2 Test procedure 1834
8.1.20.4.3 Message contents 1835
8.1.20.5 Test requirement 1839
8.1.20_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis 1841
8.1.20_2.1 Test purpose 1841
8.1.20_2.2 Test applicability 1841
8.1.20_2.3 Minimum conformance requirements 1841
8.1.20_2.4 Test description 1842
8.1.20_2.4.1 Initial conditions 1842
8.1.20_2.5 Test requirement 1843
8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 1845
8.1.21.1 Test purpose 1845
8.1.21.2 Test applicability 1845
8.1.21.3 Minimum conformance requirements 1845
8.1.21.4 Test description 1846
8.1.21.4.1 Initial conditions 1846
8.1.21.4.2 Test procedure 1847
8.1.21.4.3 Message contents 1848
8.1.21.5 Test requirement 1851
8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 1853
8.1.22.1 Test purpose 1853
8.1.22.2 Test applicability 1853
8.1.22.3 Minimum conformance requirements 1853
8.1.22.4 Test description 1854
8.1.22.4.1 Initial conditions 1854
8.1.22.4.2 Test procedure 1854
8.1.22.4.3 Message contents 1855
8.1.22.5 Test requirement 1859
8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UEin CEModeA 1861
8.1.23.1 Test purpose 1861
8.1.23.2 Test applicability 1861
8.1.23.3 Minimum conformance requirements 1861
8.1.23.4 Test description 1862
8.1.23.4.1 Initial conditions 1862
8.1.23.4.2 Test procedure 1863
8.1.23.4.3 Message contents 1863
8.1.23.5 Test requirement 1865

8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA 1867
8.1.24.1 Test purpose 1867
8.1.24.2 Test applicability 1867
8.1.24.3 Minimum conformance requirements 1867
8.1.24.4 Test description 1867
8.1.24.4.1 Initial conditions 1867
8.1.24.4.2 Test procedure 1867
8.1.24.4.3 Message contents 1868
8.1.24.5 Test requirement 1868
8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UEin CEModeA in DRX 1869
8.1.25.1 Test purpose 1869
8.1.25.2 Test applicability 1869
8.1.25.3 Minimum conformance requirements 1869
8.1.25.4 Test description 1871
8.1.25.4.1 Initial conditions 1871
8.1.25.4.2 Test procedure 1871
8.1.25.4.3 Message contents 1872
8.1.25.5 Test requirement 1874
8.1.26 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA 1877
8.1.26.1 Test purpose 1877
8.1.26.2 Test applicability 1877
8.1.26.3 Minimum conformance requirements 1877
8.1.26.4 Test description 1878
8.1.26.4.1 Initial conditions 1878
8.1.26.4.2 Test procedure 1878
8.1.26.4.3 Message contents 1879
8.1.26.5 Test requirement 1880
8.1.27 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA 1882
8.1.27.1 Test purpose 1882
8.1.27.2 Test applicability 1882
8.1.27.3 Minimum conformance requirements 1882
8.1.27.4 Test description 1883
8.1.27.4.1 Initial conditions 1883
8.1.27.4.2 Test procedure 1883
8.1.27.4.3 Message contents 1884
8.1.27.5 Test requirement 1886
8.1.28 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA in DRX 1888
8.1.28.1 Test purpose 1888
8.1.28.2 Test applicability 1888
8.1.28.3 Minimum conformance requirements 1888
8.1.28.4 Test description 1890
8.1.28.4.1 Initial conditions 1890
8.1.28.4.2 Test procedure 1890
8.1.28.4.3 Message contents 1891
8.1.28.5 Test requirement 1893
8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA 1896
8.1.29.1 Test purpose 1896
8.1.29.2 Test applicability 1896
8.1.29.3 Minimum conformance requirements 1896
8.1.29.4 Test description 1897
8.1.29.4.1 Initial conditions 1897
8.1.29.4.2 Test procedure 1897
8.1.29.4.3 Message contents 1898
8.1.29.5 Test requirement 1899
8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA in DRX 1901

8.1.30.1 Test purpose 1901
8.1.30.2 Test applicability 1901
8.1.30.3 Minimum conformance requirements 1901
8.1.30.4 Test description 1902
8.1.30.4.1 Initial conditions 1902
8.1.30.4.2 Test procedure 1903
8.1.30.4.3 Message contents 1904
8.1.30.5 Test requirement 1907
8.1.31 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB 1910
8.1.31.1 Test purpose 1910
8.1.31.2 Test applicability 1910
8.1.31.3 Minimum conformance requirements 1910
8.1.31.4 Test description 1911
8.1.31.4.1 Initial conditions 1911
8.1.31.4.2 Test procedure 1912
8.1.31.4.3 Message contents 1912
8.1.31.5 Test requirement 1914
8.1.32 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB 1915
8.1.32.1 Test purpose 1915
8.1.32.2 Test applicability 1915
8.1.32.3 Minimum conformance requirements 1915
8.1.32.4 Test description 1915
8.1.32.4.1 Initial conditions 1915
8.1.32.4.2 Test procedure 1916
8.1.32.4.3 Message contents 1916
8.1.32.5 Test requirement 1916
8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB 1918
8.1.33.1 Test purpose 1918
8.1.33.2 Test applicability 1918
8.1.33.3 Minimum conformance requirements 1918
8.1.33.4 Test description 1919
8.1.33.4.1 Initial conditions 1919
8.1.33.4.2 Test procedure 1920
8.1.33.4.3 Message contents 1920
8.1.33.5 Test requirement 1922
8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB 1924
8.1.34.1 Test purpose 1924
8.1.34.2 Test applicability 1924
8.1.34.3 Minimum conformance requirements 1924
8.1.34.4 Test description 1925
8.1.34.4.1 Initial conditions 1925
8.1.34.4.2 Test procedure 1926
8.1.34.4.3 Message contents 1926
8.1.34.5 Test requirement 1928
8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB 1930
8.1.35.1 Test purpose 1930
8.1.35.2 Test applicability 1930
8.1.35.3 Minimum conformance requirements 1930
8.1.35.4 Test description 1931
8.1.35.4.1 Initial conditions 1931
8.1.35.4.2 Test procedure 1932
8.1.35.4.3 Message contents 1932
8.1.35.5 Test requirement 1934
8.1.36 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB 1936
8.1.36.1 Test purpose 1936
8.1.36.2 Test applicability 1936

8.1.36.3 Minimum conformance requirements 1936
8.1.36.4 Test description 1937
8.1.36.4.1 Initial conditions 1937
8.1.36.4.2 Test procedure 1938
8.1.36.4.3 Message contents 1938
8.1.36.5 Test requirement 1942
8.1.37 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB 1944
8.1.37.1 Test purpose 1944
8.1.37.2 Test applicability 1944
8.1.37.3 Minimum conformance requirements 1944
8.1.37.4 Test description 1945
8.1.37.4.1 Initial conditions 1945
8.1.37.4.2 Test procedure 1945
8.1.37.4.3 Message contents 1946
8.1.37.5 Test requirement 1951
8.1.38 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB 1953
8.1.38.1 Test purpose 1953
8.1.38.2 Test applicability 1953
8.1.38.3 Minimum conformance requirements 1953
8.1.38.4 Test description 1954
8.1.38.4.1 Initial conditions 1954
8.1.38.4.2 Test procedure 1955
8.1.38.4.3 Message contents 1956
8.1.38.5 Test requirement 1959
8.1.39 E-UTRAN HD-FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB 1961
8.1.39.1 Test purpose 1961
8.1.39.2 Test applicability 1961
8.1.39.3 Minimum conformance requirements 1961
8.1.39.4 Test description 1962
8.1.39.4.1 Initial conditions 1962
8.1.39.4.2 Test procedure 1962
8.1.39.4.3 Message contents 1963
8.1.39.5 Test requirement 1968
8.1.40 E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells 1970
8.1.40.1 Test purpose 1970
8.1.40.2 Test applicability 1970
8.1.40.3 Minimum conformance requirements 1970
8.1.40.4 Test description 1971
8.1.40.4.1 Initial conditions 1971
8.1.40.4.2 Test procedure 1972
8.1.40.4.3 Message contents 1972
8.1.40.5 Test requirement 1974
8.1.41 E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap 1976
8.1.41.1 Test purpose 1976
8.1.41.2 Test applicability 1976
8.1.41.3 Minimum conformance requirements 1976
8.1.41.4 Test description 1977
8.1.41.4.1 Initial conditions 1977
8.1.41.4.2 Test procedure 1977
8.1.41.4.3 Message contents 1978
8.1.41.5 Test requirement 1980
8.1.42 E-UTRAN HD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap 1982
8.1.42.1 Test purpose 1982
8.1.42.2 Test applicability 1982
8.1.42.3 Minimum conformance requirements 1982
8.1.42.4 Test description 1982

8.1.42.4.1 Initial conditions 1982
8.1.42.4.2 Test procedure 1983
8.1.42.4.3 Message contents 1983
8.1.42.5 Test requirement 1983
8.2 E-UTRAN TDD intra frequency measurements 1984
8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells 1984
8.2.1.1 Test purpose 1984
8.2.1.2 Test applicability 1985
8.2.1.3 Minimum conformance requirements 1985
8.2.1.4 Test description 1986
8.2.1.4.1 Initial conditions 1986
8.2.1.4.2 Test procedure 1987
8.2.1.4.3 Message contents 1988
8.2.1.5 Test requirement 1989
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX 1990
8.2.2.1 Test purpose 1990
8.2.2.2 Test applicability 1990
8.2.2.3 Minimum conformance requirements 1990
8.2.2.4 Test description 1992
8.2.2.4.1 Initial conditions 1992
8.2.2.4.2 Test procedure 1993
8.2.2.4.3 Message contents 1993
8.2.2.5 Test requirement 1996
8.2.3 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 1998
8.2.3.1 Test purpose 1998
8.2.3.2 Test applicability 1998
8.2.3.3 Minimum conformance requirements 1998
8.2.3.4 Test description 1999
8.2.3.4.1 Initial conditions 1999
8.2.3.4.2 Test procedure 2000
8.2.3.4.3 Message contents 2001
8.2.3.5 Test requirement 2004
8.2.4 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX 2006
8.2.4.1 Test purpose 2006
8.2.4.2 Test applicability 2006
8.2.4.3 Minimum conformance requirements 2006
8.2.4.4 Test description 2006
8.2.4.4.1 Initial conditions 2006
8.2.4.4.2 Test procedure 2007
8.2.4.4.3 Message contents 2008
8.2.4.5 Test requirement 2012
8.2.5 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) 2014
8.2.5.1 Test purpose 2014
8.2.5.2 Test applicability 2014
8.2.5.3 Minimum conformance requirements 2014
8.2.5.4 Test description 2015
8.2.5.4.1 Initial conditions 2015
8.2.5.4.2 Test procedure 2016
8.2.5.4.3 Message contents 2017
8.2.5.5 Test requirements 2020
8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 2021
8.2.6.1 Test purpose 2021
8.2.6.2 Test applicability 2021
8.2.6.3 Minimum conformance requirements 2021
8.2.6.4 Test description 2022

8.2.6.4.1 Initial conditions 2022
8.2.6.4.2 Test procedure 2024
8.2.6.4.3 Message contents 2024
8.2.6.5 Test requirements 2027
8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 2029
8.2.7.1 Test purpose 2029
8.2.7.2 Test applicability 2029
8.2.7.3 Minimum conformance requirements 2029
8.2.7.4 Test description 2030
8.2.7.4.1 Initial conditions 2030
8.2.7.4.2 Test procedure 2031
8.2.7.4.3 Message contents 2032
8.2.7.5 Test requirement 2035
8.2.7_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis 2037
8.2.7_2.1 Test purpose 2037
8.2.7_2.2 Test applicability 2037
8.2.7_2.3 Minimum conformance requirements 2037
8.2.7_2.4 Test description 2038
8.2.7_2.4.1 Initial conditions 2038
8.2.7_2.4.2 Test procedure 2039
8.2.7_2.4.3 Message contents 2040
8.2.7_2.5 Test requirement 2043
8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 2045
8.2.8.1 Test purpose 2045
8.2.8.2 Test applicability 2045
8.2.8.3 Minimum conformance requirements 2045
8.2.8.4 Test description 2046
8.2.8.4.1 Initial conditions 2046
8.2.8.4.2 Test procedure 2047
8.2.8.4.3 Message contents 2048
8.2.8.5 Test requirement 2052
8.2.8_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis 2054
8.2.8_2.1 Test purpose 2054
8.2.8_2.2 Test applicability 2054
8.2.8_2.3 Minimum conformance requirements 2054
8.2.8_2.4 Test description 2055
8.2.8_2.4.1 Initial conditions 2055
8.2.8_2.4.2 Test procedure 2056
8.2.8_2.4.3 Message contents 2057
8.2.8_2.5 Test requirement 2061
8.2.9 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB 2063
8.2.9.1 Test purpose 2063
8.2.9.2 Test applicability 2063
8.2.9.3 Minimum conformance requirements 2063
8.2.9.4 Test description 2064
8.2.9.4.1 Initial conditions 2064
8.2.9.4.2 Test procedure 2065
8.2.9.4.3 Message contents 2066
8.2.9.5 Test requirement 2069
8.2.10 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB 2071
8.2.10.1 Test purpose 2071
8.2.10.2 Test applicability 2071
8.2.10.3 Minimum conformance requirements 2071
8.2.10.4 Test description 2072
8.2.10.4.1 Initial conditions 2072
8.2.10.4.2 Test procedure 2073

8.2.10.4.3 Message contents 2073
8.2.10.5 Test requirement 2078
8.2.11 E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells 2080
8.2.11.1 Test purpose 2080
8.2.11.2 Test applicability 2080
8.2.11.3 Minimum conformance requirements 2080
8.2.11.4 Test description 2082
8.2.11.4.1 Initial conditions 2082
8.2.11.4.2 Test procedure 2082
8.2.11.4.3 Message contents 2083
8.2.11.5 Test requirement 2086
8.2.12 2089
8.2.13 2089
8.2.14 E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE in CEModeA without gap 2089
8.2.14.1 Test purpose 2089
8.2.14.2 Test applicability 2089
8.2.14.3 Minimum conformance requirements 2089
8.2.14.4 Test description 2091
8.2.14.4.1 Initial conditions 2091
8.2.14.4.2 Test procedure 2092
8.2.14.4.3 Message contents 2092
8.2.14.5 Test requirement 2094
8.3 E-UTRAN FDD-FDD Inter-frequency Measurements 2095
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells 2095
8.3.1.1 Test purpose 2095
8.3.1.2 Test applicability 2096
8.3.1.3 Minimum conformance requirements 2096
8.3.1.4 Test description 2097
8.3.1.4.1 Initial conditions 2097
8.3.1.4.2 Test procedure 2097
8.3.1.4.3 Message contents 2098
8.3.1.5 Test requirement 2099
8.3.1_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis 2101
8.3.1_2.1 Test purpose 2101
8.3.1_2.2 Test applicability 2101
8.3.1_2.3 Minimum conformance requirements 2101
8.3.1_2.4 Test description 2102
8.3.1_2.4.1 Initial conditions 2102
8.3.1_2.4.2 Test procedure 2103
8.3.1_2.4.3 Message contents 2104
8.3.1_2.5 Test requirement 2105
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells 2106
8.3.2.1 Test purpose 2106
8.3.2.2 Test applicability 2106
8.3.2.3 Minimum conformance requirements 2106
8.3.2.4 Test description 2108
8.3.2.4.1 Initial conditions 2108
8.3.2.4.2 Test procedure 2109
8.3.2.4.3 Message contents 2110
8.3.2.5 Test requirement 2112
8.3.2_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells for UE category 1bis 2114
8.3.2_2.1 Test purpose 2114
8.3.2_2.2 Test applicability 2114
8.3.2_2.3 Minimum conformance requirements 2114
8.3.2_2.4 Test description 2116
8.3.2_2.4.1 Initial conditions 2116

8.3.2_2.4.2 Test procedure 2117
8.3.2_2.4.3 Message contents 2117
8.3.2_2.5 Test requirement 2119
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used 2122
8.3.3.1 Test purpose 2122
8.3.3.2 Test applicability 2122
8.3.3.3 Minimum conformance requirements 2122
8.3.3.4 Test description 2123
8.3.3.4.1 Initial conditions 2123
8.3.3.4.2 Test procedure 2124
8.3.3.4.3 Message contents 2125
8.3.3.5 Test requirement 2127
8.3.3_2 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used for UE category 1bis 2129
8.3.3_2.1 Test purpose 2129
8.3.3_2.2 Test applicability 2129
8.3.3_2.3 Minimum conformance requirements 2129
8.3.3_2.4 Test description 2130
8.3.3_2.4.1 Initial conditions 2130
8.3.3_2.4.2 Test procedure 2131
8.3.3_2.4.3 Message contents 2132
8.3.3_2.5 Test requirement 2134
8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 2136
8.3.4.1 Test purpose 2136
8.3.4.2 Test applicability 2136
8.3.4.3 Minimum conformance requirements 2136
8.3.4.4 Test description 2137
8.3.4.4.1 Initial conditions 2137
8.3.4.4.2 Test procedure 2138
8.3.4.4.3 Message contents 2139
8.3.4.5 Test requirement 2144
8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX 2145
8.3.5.1 Test purpose 2145
8.3.5.2 Test applicability 2145
8.3.5.3 Minimum conformance requirements 2145
8.3.5.4 Test description 2145
8.3.5.4.1 Initial conditions 2145
8.3.5.4.2 Test procedure 2146
8.3.5.4.3 Message contents 2147
8.3.5.5 Test requirement 2152
8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells 2154
8.3.6.1 Test purpose 2154
8.3.6.2 Test applicability 2154
8.3.6.3 Minimum conformance requirements 2154
8.3.6.4 Test description 2155
8.3.6.4.1 Initial conditions 2155
8.3.6.4.2 Test procedure 2156
8.3.6.4.3 Message contents 2157
8.3.6.5 Test requirement 2161
8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group 2162
8.3.7.1 Test purpose 2162
8.3.7.2 Test applicability 2162
8.3.7.3 Minimum conformance requirements 2162
8.3.7.4 Test description 2164
8.3.7.4.1 Initial conditions 2164
8.3.7.4.2 Test procedure 2164

8.3.7.4.3 Message contents 2165
8.3.7.5 Test requirement 2166
8.3.8 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, non DRX 2169
8.3.8.1 Test purpose 2169
8.3.8.2 Test applicability 2169
8.3.8.3 Minimum conformance requirements 2169
8.3.8.4 Test description 2170
8.3.8.4.1 Initial conditions 2170
8.3.8.4.2 Test procedure 2171
8.3.8.4.3 Message contents 2172
8.3.8.5 Test requirement 2173
8.3.9 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX 2176
8.3.9.1 Test purpose 2176
8.3.9.2 Test applicability 2176
8.3.9.3 Minimum conformance requirements 2176
8.3.9.4 Test description 2177
8.3.9.4.1 Initial conditions 2177
8.3.9.4.2 Test procedure 2178
8.3.9.4.3 Message contents 2179
8.3.9.5 Test requirement 2180
8.3.10 to 8.3.11 2182
8.3.12 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA 2182
8.3.12.1 Test purpose 2182
8.3.12.2 Test applicability 2182
8.3.12.3 Minimum conformance requirements 2182
8.3.12.4 Test description 2184
8.3.12.4.1 Initial conditions 2184
8.3.12.4.2 Test procedure 2185
8.3.12.4.3 Message contents 2186
8.3.12.5 Test requirement 2188
8.3.13 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA 2189
8.3.13.1 Test purpose 2189
8.3.13.2 Test applicability 2189
8.3.13.3 Minimum conformance requirements 2189
8.3.13.4 Test description 2189
8.3.13.4.1 Initial conditions 2189
8.3.13.4.2 Test procedure 2189
8.3.13.4.3 Message contents 2189
8.3.13.5 Test requirement 2189
8.3.14 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB 2191
8.3.14.1 Test purpose 2191
8.3.14.2 Test applicability 2191
8.3.14.3 Minimum conformance requirements 2191
8.3.14.4 Test description 2193
8.3.14.4.1 Initial conditions 2193
8.3.14.4.2 Test procedure 2193
8.3.14.4.3 Message contents 2194
8.3.14.5 Test requirement 2196
8.3.15 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB 2197
8.3.15.1 Test purpose 2197
8.3.15.2 Test applicability 2197
8.3.15.3 Minimum conformance requirements 2197
8.3.15.4 Test description 2197
8.3.15.4.1 Initial conditions 2197
8.3.15.4.2 Test procedure 2197
8.3.15.4.3 Message contents 2197

8.3.15.5 Test requirement 2197
8.3.16 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used 2199
8.3.16.1 Test purpose 2199
8.3.16.2 Test applicability 2199
8.3.16.3 Minimum conformance requirements 2199
8.3.16.4 Test description 2200
8.3.16.4.1 Initial conditions 2200
8.3.16.4.2 Test procedure 2201
8.3.16.4.3 Message contents 2202
8.3.16.5 Test requirement 2204
8.3.17 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used 2206
8.3.17.1 Test purpose 2206
8.3.17.2 Test applicability 2206
8.3.17.3 Minimum conformance requirements 2206
8.3.17.4 Test description 2208
8.3.17.4.1 Initial conditions 2208
8.3.17.4.2 Test procedure 2208
8.3.17.4.3 Message contents 2208
8.3.17.5 Test requirement 2208
8.3.18 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used 2210
8.3.18.1 Test purpose 2210
8.3.18.2 Test applicability 2210
8.3.18.3 Minimum conformance requirements 2210
8.3.18.4 Test description 2212
8.3.18.4.1 Initial conditions 2212
8.3.18.4.2 Test procedure 2213
8.3.18.4.3 Message contents 2213
8.3.18.5 Test requirement 2216
8.3.19 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used 2218
8.3.19.1 Test purpose 2218
8.3.19.2 Test applicability 2218
8.3.19.3 Minimum conformance requirements 2219
8.3.19.4 Test description 2220
8.3.19.4.1 Initial conditions 2220
8.3.19.4.2 Test procedure 2220
8.3.19.4.3 Message contents 2220
8.3.19.5 Test requirement 2220
8.4 E-UTRAN TDD-TDD inter frequency measurements 2222
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells 2222
8.4.1.1 Test purpose 2222
8.4.1.2 Test applicability 2222
8.4.1.3 Minimum conformance requirements 2223
8.4.1.4 Test description 2224
8.4.1.4.1 Initial conditions 2224
8.4.1.4.2 Test procedure 2224
8.4.1.4.3 Message contents 2225
8.4.1.5 Test requirement 2226
8.4.1_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis 2228
8.4.1_2.1 Test purpose 2228
8.4.1_2.2 Test applicability 2228
8.4.1_2.3 Minimum conformance requirements 2228
8.4.1_2.4 Test description 2229
8.4.1_2.4.1 Initial conditions 2229
8.4.1_2.4.2 Test procedure 2230
8.4.1_2.4.3 Message contents 2231
8.4.1_2.5 Test requirement 2232

8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells 2233
8.4.2.1 Test purpose 2233
8.4.2.2 Test applicability 2233
8.4.2.3 Minimum conformance requirements 2233
8.4.2.4 Test description 2235
8.4.2.4.1 Initial conditions 2235
8.4.2.4.2 Test procedure 2236
8.4.2.4.3 Message contents 2237
8.4.2.5 Test requirement 2239
8.4.2_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells for UE category 1bis 2241
8.4.2_2.1 Test purpose 2241
8.4.2_2.2 Test applicability 2241
8.4.2_2.3 Minimum conformance requirements 2241
8.4.2_2.4 Test description 2243
8.4.2_2.4.1 Initial conditions 2243
8.4.2_2.4.2 Test procedure 2244
8.4.2_2.4.3 Message contents 2245
8.4.2_2.5 Test requirement 2247
8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used 2249
8.4.3.1 Test purpose 2249
8.4.3.2 Test applicability 2249
8.4.3.3 Minimum conformance requirements 2249
8.4.3.4 Test description 2251
8.4.3.4.1 Initial conditions 2251
8.4.3.4.2 Test procedure 2252
8.4.3.4.3 Message contents 2253
8.4.3.5 Test requirement 2256
8.4.3_2 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used for UE category 1bis 2258
8.4.3_2.1 Test purpose 2258
8.4.3_2.2 Test applicability 2258
8.4.3_2.3 Minimum conformance requirements 2258
8.4.3_2.4 Test description 2259
8.4.3_2.4.1 Initial conditions 2259
8.4.3_2.4.2 Test procedure 2260
8.4.3_2.4.3 Message contents 2261
8.4.3_2.5 Test requirement 2264
8.4.4 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 2265
8.4.4.1 Test purpose 2265
8.4.4.2 Test applicability 2266
8.4.4.3 Minimum conformance requirements 2266
8.4.4.4 Test description 2266
8.4.4.4.1 Initial conditions 2266
8.4.4.4.2 Test procedure 2267
8.4.4.4.3 Message contents 2268
8.4.4.5 Test requirement 2271
8.4.5 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX 2273
8.4.5.1 Test purpose 2273
8.4.5.2 Test applicability 2273
8.4.5.3 Minimum conformance requirements 2273
8.4.5.4 Test description 2273
8.4.5.4.1 Initial conditions 2273
8.4.5.4.2 Test procedure 2274
8.4.5.4.3 Message contents 2275
8.4.5.5 Test requirement 2280
8.4.6 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 2281
8.4.6.1 Test purpose 2281

8.4.6.2 Test applicability 2281
8.4.6.3 Minimum conformance requirements 2281
8.4.6.4 Test description 2283
8.4.6.4.1 Initial conditions 2283
8.4.6.4.2 Test procedure 2284
8.4.6.4.3 Message contents 2285
8.4.6.5 Test requirement 2286
8.4.6_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 for UE category 1bis 2288
8.4.6_2.4 Test description 2289
8.4.6_2.4.1 Initial conditions 2289
8.4.6_2.4.2 Test procedure 2290
8.4.6_2.4.3 Message contents 2291
8.4.6_2.5 Test requirement 2292
8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group 2294
8.4.7.1 Test purpose 2294
8.4.7.2 Test applicability 2294
8.4.7.3 Minimum conformance requirements 2294
8.4.7.4 Test description 2295
8.4.7.4.1 Initial conditions 2295
8.4.7.4.2 Test procedure 2296
8.4.7.4.3 Message contents 2297
8.4.7.5 Test requirement 2298
8.4.8 TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX 2301
8.4.8.1 Test purpose 2301
8.4.8.2 Test applicability 2301
8.4.8.3 Minimum conformance requirements 2301
8.4.8.4 Test description 2302
8.4.8.4.1 Initial conditions 2302
8.4.7.4.2 Test procedure 2303
8.4.8.4.3 Message contents 2304
8.4.8.5 Test requirement 2305
8.4.9 TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX 2307
8.4.9.1 Test purpose 2307
8.4.9.2 Test applicability 2307
8.4.9.3 Minimum conformance requirements 2307
8.4.9.4 Test description 2309
8.4.9.4.1 Initial conditions 2309
8.4.9.4.2 Test procedure 2309
8.4.9.4.3 Message contents 2310
8.4.9.5 Test requirement 2311
8.4.10 2313
8.4.11 2313
8.4.12 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA 2313
8.4.12.1 Test purpose 2313
8.4.12.2 Test applicability 2313
8.4.12.3 Minimum conformance requirements 2313
8.4.12.4 Test description 2315
8.4.12.4.1 Initial conditions 2315
8.4.12.4.2 Test procedure 2316
8.4.12.4.3 Message contents 2317
8.4.12.5 Test requirement 2319
8.4.13 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB 2320
8.4.13.1 Test purpose 2320
8.4.13.2 Test applicability 2320
8.4.13.3 Minimum conformance requirements 2320

8.4.13.4 Test description 2322
8.4.13.4.1 Initial conditions 2322
8.4.13.4.2 Test procedure 2323
8.4.13.4.3 Message contents 2323
8.4.13.5 Test requirement 2323
8.4.14 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used 2325
8.4.14.1 Test purpose 2325
8.4.14.2 Test applicability 2325
8.4.14.3 Minimum conformance requirements 2325
8.4.14.4 Test description 2326
8.4.14.4.1 Initial conditions 2326
8.4.14.4.2 Test procedure 2327
8.4.14.4.3 Message contents 2328
8.4.14.5 Test requirement 2330
8.4.15 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used 2332
8.4.15.1 Test purpose 2332
8.4.15.2 Test applicability 2332
8.4.15.3 Minimum conformance requirements 2332
8.4.15.4 Test description 2334
8.4.15.4.1 Initial conditions 2334
8.4.15.4.2 Test procedure 2335
8.4.15.4.3 Message contents 2335
8.4.15.5 Test requirement 2336
8.5 E-UTRAN FDD - UTRAN measurements 2337
8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions 2337
8.5.1.1 Test purpose 2337
8.5.1.2 Test applicability 2337
8.5.1.3 Minimum conformance requirements 2338
8.5.1.4 Test description 2339
8.5.1.4.1 Initial conditions 2339
8.5.1.4.2 Test procedure 2340
8.5.1.4.3 Message contents 2340
8.5.1.5 Test requirement 2342
8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions 2343
8.5.2.1 Test purpose 2343
8.5.2.2 Test applicability 2344
8.5.2.3 Minimum conformance requirements 2344
8.5.2.4 Test description 2344
8.5.2.4.1 Initial conditions 2344
8.5.2.4.2 Test procedure 2345
8.5.2.4.3 Message contents 2346
8.5.2.5 Test requirement 2349
8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions 2350
8.5.3.1 Test purpose 2350
8.5.3.2 Test applicability 2350
8.5.3.3 Minimum conformance requirements 2350
8.5.3.4 Test description 2352
8.5.3.4.1 Initial conditions 2352
8.5.3.4.2 Test procedure 2353
8.5.3.4.3 Message contents 2354
8.5.3.5 Test requirement 2356
8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions 2359
8.5.4.1 Test purpose 2359
8.5.4.2 Test applicability 2359
8.5.4.3 Minimum conformance requirements 2359
8.5.4.4 Test description 2359
8.5.4.4.1 Initial conditions 2359
8.5.4.4.2 Test procedure 2360

8.5.4.4.3 Message contents 2361
8.5.4.5 Test requirement 2362
8.5.5 2364
8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions 2364
8.5.6.2 Test applicability 2364
8.5.6.4 Test description 2365
8.5.6.4.1 Initial conditions 2365
8.5.6.4.2 Test procedure 2366
8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth 2371
8.5.7.1 Test purpose 2371
8.5.7.2 Test applicability 2371
8.5.7.3 Minimum conformance requirements 2371
8.5.7.4 Test description 2371
8.5.7.4.1 Initial conditions 2371
8.5.7.4.2 Test procedure 2372
8.5.7.4.3 Message contents 2372
8.5.7.5 Test requirement 2372
8.5.8 E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX 2373
8.5.8.1 Test purpose 2373
8.5.8.2 Test applicability 2373
8.5.8.3 Minimum conformance requirements 2373
8.5.8.4 Test description 2374
8.5.8.4.1 Initial conditions 2374
8.5.8.4.2 Test procedure 2375
8.5.8.4.3 Message contents 2376
8.5.8.5 Test requirement 2377
8.6 E-UTRAN TDD - UTRAN FDD measurements 2379
8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions 2379
8.6.1.1 Test purpose 2379
8.6.1.2 Test applicability 2379
8.6.1.3 Minimum conformance requirements 2379
8.6.1.4 Test description 2381
8.6.1.4.1 Initial conditions 2381
8.6.1.4.2 Test procedure 2382
8.6.1.4.3 Message contents 2383
8.6.1.5 Test requirement 2384
8.6.2 2386
8.6.3 E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX 2386
8.6.3.1 Test purpose 2386
8.6.3.2 Test applicability 2386
8.6.3.3 Minimum conformance requirements 2386
8.6.3.4 Test description 2387
8.6.3.4.1 Initial conditions 2387
8.6.3.4.2 Test procedure 2388
8.6.3.4.3 Message contents 2389
8.6.3.5 Test requirement 2390
8.7 E-UTRAN TDD - UTRAN measurements 2392
8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions 2392
8.7.1.1 Test purpose 2392
8.7.1.2 Test applicability 2392
8.7.1.3 Minimum conformance requirements 2393
8.7.1.4 Test description 2394
8.7.1.4.1 Initial conditions 2394
8.7.1.4.2 Test procedure 2395
8.7.1.4.3 Message contents 2395
8.7.1.5 Test requirement 2397
8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions 2398
8.7.2.1 Test purpose 2398

8.7.2.2 Test applicability 2399
8.7.2.3 Minimum conformance requirements 2399
8.7.2.4 Test description 2400
8.7.2.4.1 Initial conditions 2400
8.7.2.4.2 Test procedure 2401
8.7.2.4.3 Message contents 2402
8.7.2.5 Test requirement 2404
8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions 2407
8.7.3.1 Test purpose 2407
8.7.3.2 Test applicability 2407
8.7.3.3 Minimum conformance requirements 2407
8.7.3.4 Test description 2408
8.7.3.4.1 Initial conditions 2408
8.7.3.4.2 Test procedure 2408
8.7.3.4.3 Message contents 2409
8.7.3.5 Test requirement 2411
8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions 2413
8.7.4.1 Test purpose 2413
8.7.4.2 Test applicability 2413
8.7.4.3 Minimum conformance requirements 2413
8.7.4.4 Test description 2413
8.7.4.4.1 Initial conditions 2413
8.7.4.4.2 Test procedure 2414
8.7.4.4.3 Message contents 2415
8.7.4.5 Test requirement 2417
8.7.5 E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX 2419
8.7.5.1 Test purpose 2419
8.7.5.2 Test applicability 2419
8.7.5.3 Minimum conformance requirements 2419
8.7.5.4 Test description 2420
8.7.5.4.1 Initial conditions 2420
8.7.5.4.2 Test procedure 2421
8.7.5.4.3 Message contents 2422
8.7.5.5 Test requirement 2423
8.7A E-UTRA FDD – UTRA TDD Measurement 2425
8.7A.1 E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX 2425
8.7A.1.1 Test purpose 2425
8.7A.1.2 Test applicability 2425
8.7A.1.3 Minimum conformance requirements 2426
8.7A.1.4 Test description 2427
8.7A.1.4.1 Initial conditions 2427
8.7A.1.4.2 Test procedure 2428
8.7A.1.4.3 Message contents 2428
8.A7.1.5 Test requirement 2430
8.8 E-UTRAN FDD - GSM measurements 2432
8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN 2432
8.8.1.1 Test purpose 2432
8.8.1.2 Test applicability 2432
8.8.1.3 Minimum conformance requirements 2432
8.8.1.4 Test description 2434
8.8.1.4.1 Initial conditions 2434
8.8.1.4.2 Test procedure 2435
8.8.1.4.3 Message contents 2436
8.8.1.5 Test requirement 2438
8.8.2 E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN 2439
8.8.2.1 Test purpose 2439
8.8.2.2 Test applicability 2439
8.8.2.3 Minimum conformance requirements 2439
8.8.2.4 Test description 2441

8.8.2.4.1 Initial conditions 2441
8.8.2.4.2 Test procedure 2442
8.8.2.4.3 Message contents 2443
8.8.2.5 Test requirement 2445
8.9 E-UTRAN FDD - UTRAN TDD measurements 2448
8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions 2448
8.9.1.1 Test purpose 2448
8.9.1.2 Test applicability 2448
8.9.1.3 Minimum requirement 2448
8.9.1.4 Test description 2449
8.9.1.4.1 Initial conditions 2449
8.9.1.4.2 Test procedure 2450
8.9.1.4.3 Message contents 2451
8.9.1.5 Test requirement 2452
8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions 2454
8.9.2.1 Test purpose 2454
8.9.2.2 Test applicability 2454
8.9.2.3 Minimum conformance requirements 2454
8.9.2.4 Test description 2454
8.9.2.4.1 Initial conditions 2454
8.9.2.4.2 Test procedure 2455
8.9.2.4.3 Message contents 2456
8.9.2.5 Test requirement 2457
8.10 E-UTRAN TDD - GSM measurements 2460
8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN 2460
8.10.1.1 Test purpose 2460
8.10.1.2 Test applicability 2460
8.10.1.3 Minimum conformance requirements 2460
8.10.1.4 Test description 2462
8.10.1.4.1 Initial conditions 2462
8.10.1.4.2 Test procedure 2463
8.10.1.4.3 Message contents 2464
8.10.1.5 Test requirement 2466
8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN 2467
8.10.2.1 Test purpose 2467
8.10.2.2 Test applicability 2467
8.10.2.3 Minimum conformance requirements 2467
8.10.2.4 Test description 2469
8.10.2.4.1 Initial conditions 2469
8.10.2.4.2 Test procedure 2470
8.10.2.4.3 Message contents 2471
8.10.2.5 Test requirement 2474
8.11 Monitoring of Multiple Layers 2476
8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions 2476
8.11.1.1 Test purpose 2476
8.11.1.2 Test applicability 2476
8.11.1.3 Minimum conformance requirements 2476
8.11.1.4 Test description 2477
8.11.1.4.1 Initial conditions 2477
8.11.1.4.2 Test procedure 2478
8.11.1.4.3 Message contents 2479
8.11.1.5 Test requirement 2482
8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions 2484
8.11.2.1 Test purpose 2484
8.11.2.2 Test applicability 2484
8.11.2.3 Minimum conformance requirements 2484
8.11.2.4 Test description 2485
8.11.2.4.1 Initial conditions 2485
8.11.2.4.2 Test procedure 2486
8.11.2.4.3 Message contents 2487

8.11.2.5 Test requirement 2490
8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions 2492
8.11.3.1 Test purpose 2492
8.11.3.2 Test applicability 2492
8.11.3.3 Minimum conformance requirements 2492
8.11.3.4 Test description 2494
8.11.3.4.1 Initial conditions 2494
8.11.3.4.2 Test procedure 2495
8.11.3.4.3 Message contents 2496
8.11.3.5 Test requirement 2500
8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search 2502
8.11.4.1 Test purpose 2502
8.11.4.2 Test applicability 2502
8.11.4.3 Minimum conformance requirements 2502
8.11.4.4 Test description 2505
8.11.4.4.1 Initial conditions 2505
8.11.4.4.2 Test procedure 2506
8.11.4.4.3 Message contents 2507
8.11.4.5 Test requirement 2511
8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions 2513
8.11.5.1 Test purpose 2513
8.11.5.2 Test applicability 2513
8.11.5.3 Minimum conformance requirements 2513
8.11.5.4 Test description 2516
8.11.5.4.1 Initial conditions 2516
8.11.5.4.2 Test procedure 2517
8.11.5.4.3 Message contents 2518
8.11.5.5 Test requirement 2523
8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions 2524
8.11.6.1 Test purpose 2524
8.11.6.2 Test applicability 2525
8.11.6.3 Minimum conformance requirements 2525
8.11.6.4 Test description 2528
8.11.6.4.1 Initial conditions 2528
8.11.6.4.2 Test procedure 2529
8.11.6.4.3 Message contents 2530
8.11.6.5 Test requirement 2535
8.12 Void 2537
8.13 Void 2537
8.14 E-UTRAN TDD - FDD Inter-frequency Measurements 2537
8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells 2537
8.14.1.1 Test purpose 2537
8.14.1.2 Test applicability 2537
8.14.1.3 Minimum conformance requirements 2537
8.14.1.4 Test description 2538
8.14.1.4.1 Initial conditions 2538
8.14.1.4.2 Test procedure 2539
8.14.1.4.3 Message contents 2540
8.14.1.5 Test requirement 2541
8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells 2543
8.14.2.1 Test purpose 2543
8.14.2.2 Test applicability 2543
8.14.2.3 Minimum conformance requirements 2543
8.14.2.4 Test description 2544
8.14.2.4.1 Initial conditions 2544
8.14.2.4.2 Test procedure 2545
8.14.2.4.3 Message contents 2546

8.14.2.5 Test requirement 2548
8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 2551
8.14.3.1 Test purpose 2551
8.14.3.2 Test applicability 2551
8.14.3.3 Minimum conformance requirements 2551
8.14.3.4 Test description 2552
8.14.3.4.1 Initial conditions 2552
8.14.3.4.2 Test procedure 2552
8.14.3.4.3 Message contents 2553
8.14.3.5 Test requirement 2557
8.15 E-UTRAN FDD - TDD Inter-frequency Measurements 2559
8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells 2559
8.15.1.1 Test purpose 2559
8.15.1.2 Test applicability 2559
8.15.1.3 Minimum conformance requirements 2559
8.15.1.4 Test description 2560
8.15.1.4.1 Initial conditions 2560
8.15.1.4.2 Test procedure 2561
8.15.1.4.3 Message contents 2562
8.15.1.5 Test requirement 2563
8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells 2564
8.15.2.1 Test purpose 2564
8.15.2.2 Test applicability 2564
8.15.2.3 Minimum conformance requirements 2564
8.15.2.4 Test description 2566
8.15.2.4.1 Initial conditions 2566
8.15.2.4.2 Test procedure 2567
8.15.2.4.3 Message contents 2568
8.15.2.5 Test requirement 2570
8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps 2572
8.15.3.1 Test purpose 2572
8.15.3.2 Test applicability 2572
8.15.3.3 Minimum conformance requirements 2572
8.15.3.4 Test description 2573
8.15.3.4.1 Initial conditions 2573
8.15.3.4.2 Test procedure 2574
8.15.3.4.3 Message contents 2575
8.15.3.5 Test requirement 2579
8.16 E-UTRAN Carrier Aggregation Measurements 2580
8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX 2580
8.16.1.1 Test purpose 2580
8.16.1.2 Test applicability 2580
8.16.1.3 Minimum conformance requirements 2580
8.16.1.4 Test description 2581
8.16.1.4.1 Initial conditions 2581
8.16.1.4.2 Test procedure 2582
8.16.1.4.3 Message contents 2583
8.16.1.5 Test requirement 2587
8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX 2589
8.16.2.1 Test purpose 2589
8.16.2.2 Test applicability 2589
8.16.2.3 Minimum conformance requirements 2589
8.16.2.4 Test description 2590
8.16.2.4.1 Initial conditions 2590
8.16.2.4.2 Test procedure 2591
8.16.2.4.3 Message contents 2592
8.16.2.5 Test requirement 2596

8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX 2598
8.16.3.1 Test purpose 2598
8.16.3.2 Test applicability 2598
8.16.3.3 Minimum conformance requirements 2598
8.16.3.4 Test description 2599
8.16.3.4.1 Initial conditions 2599
8.16.3.4.2 Test procedure 2600
8.16.3.4.3 Message contents 2601
8.16.3.5 Test requirement 2602
8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX 2604
8.16.4.1 Test purpose 2604
8.16.4.2 Test applicability 2604
8.16.4.3 Minimum conformance requirements 2604
8.16.4.4 Test description 2605
8.16.4.4.1 Initial conditions 2605
8.16.4.4.2 Test procedure 2606
8.16.4.4.3 Message contents 2607
8.16.4.5 Test requirement 2607
8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth 2609
8.16.5.1 Test purpose 2609
8.16.5.2 Test applicability 2609
8.16.5.3 Minimum conformance requirements 2609
8.16.5.4 Test description 2610
8.16.5.4.1 Initial conditions 2610
8.16.5.4.2 Test procedure 2610
8.16.5.4.3 Message contents 2611
8.16.5.5 Test requirement 2615
8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth 2616
8.16.6.1 Test purpose 2616
8.16.6.2 Test applicability 2617
8.16.6.3 Minimum conformance requirements 2617
8.16.6.4 Test description 2617
8.16.6.4.1 Initial conditions 2617
8.16.6.4.2 Test procedure 2618
8.16.6.4.3 Message contents 2619
8.16.6.5 Test requirement 2623
8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth 2624
8.16.7.1 Test purpose 2624
8.16.7.2 Test applicability 2624
8.16.7.3 Minimum conformance requirements 2625
8.16.7.4 Test description 2625
8.16.7.4.1 Initial conditions 2625
8.16.7.4.2 Test procedure 2626
8.16.7.4.3 Message contents 2627
8.16.7.5 Test requirement 2628
8.16.8 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth 2629
8.16.8.1 Test purpose 2629
8.16.8.2 Test applicability 2629
8.16.8.3 Minimum conformance requirements 2629
8.16.8.4 Test description 2630
8.16.8.4.1 Initial conditions 2630
8.16.8.4.2 Test procedure 2630
8.16.8.4.3 Message contents 2631
8.16.8.5 Test requirement 2632
8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz 2632
8.16.9.1 Test purpose 2632

8.16.9.2 Test applicability 2633
8.16.9.3 Minimum conformance requirements 2633
8.16.9.4 Test description 2633
8.16.9.4.1 Initial conditions 2633
8.16.9.4.2 Test procedure 2633
8.16.9.4.3 Message contents 2633
8.16.9.5 Test requirement 2634
8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz 2635
8.16.10.1 Test purpose 2635
8.16.10.2 Test applicability 2635
8.16.10.3 Minimum conformance requirements 2635
8.16.10.4 Test description 2635
8.16.10.4.1 Initial conditions 2635
8.16.10.4.2 Test procedure 2636
8.16.10.4.3 Message contents 2636
8.16.10.5 Test requirement 2636
8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz 2637
8.16.11.1 Test purpose 2637
8.16.11.2 Test applicability 2638
8.16.11.3 Minimum conformance requirements 2638
8.16.11.4 Test description 2638
8.16.11.4.1 Initial conditions 2638
8.16.11.4.2 Test procedure 2639
8.16.11.4.3 Message contents 2639
8.16.11.5 Test requirement 2639
8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz 2639
8.16.12.1 Test purpose 2639
8.16.12.2 Test applicability 2639
8.16.12.3 Minimum conformance requirements 2639
8.16.12.4 Test description 2639
8.16.12.4.1 Initial conditions 2639
8.16.12.4.2 Test procedure 2640
8.16.12.4.3 Message contents 2640
8.16.12.5 Test requirement 2640
8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz 2641
8.16.13.1 Test purpose 2641
8.16.13.2 Test applicability 2641
8.16.13.3 Minimum conformance requirements 2641
8.16.13.4 Test description 2641
8.16.13.4.1 Initial conditions 2641
8.16.13.4.2 Test procedure 2642
8.16.13.4.3 Message contents 2642
8.16.13.5 Test requirement 2642
8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz bandwidth 2643
8.16.14.1 Test purpose 2643
8.16.14.2 Test applicability 2643
8.16.14.3 Minimum conformance requirements 2643
8.16.14.4 Test description 2644
8.16.14.4.1 Initial conditions 2644
8.16.14.4.2 Test procedure 2644
8.16.14.4.3 Message contents 2644
8.16.14.5 Test requirement 2644
8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth 2645
8.16.15.1 Test purpose 2645
8.16.15.2 Test applicability 2645
8.16.15.3 Minimum conformance requirements 2646
8.16.15.4 Test description 2646
8.16.15.4.1 Initial conditions 2646

8.16.15.4.2 Test procedure 2646
8.16.15.4.3 Message contents 2646
8.16.15.5 Test requirement 2647
8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth 2647
8.16.16.1 Test purpose 2647
8.16.16.2 Test applicability 2647
8.16.16.3 Minimum conformance requirements 2647
8.16.16.4 Test description 2647
8.16.16.4.1 Initial conditions 2647
8.16.16.4.2 Test procedure 2648
8.16.16.4.3 Message contents 2648
8.16.16.5 Test requirement 2648
8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX 2649
8.16.17.1 Test purpose 2649
8.16.17.2 Test applicability 2649
8.16.17.3 Minimum conformance requirements 2649
8.16.17.4 Test description 2650
8.16.17.4.1 Initial conditions 2650
8.16.17.4.2 Test procedure 2651
8.16.17.4.3 Message contents 2653
8.16.17.5 Test requirement 2655
8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth 2658
8.16.17A.1 Test purpose 2658
8.16.17A.2 Test applicability 2658
8.16.17A.3 Minimum conformance requirements 2658
8.16.17A.4 Test description 2658
8.16.17A.4.1 Initial conditions 2658
8.16.17A.4.2 Test procedure 2658
8.16.17A.4.3 Message contents 2658
8.16.17A.5 Test requirement 2659
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX 2659
8.16.18.1 Test purpose 2659
8.16.18.2 Test applicability 2659
8.16.18.3 Minimum conformance requirements 2659
8.16.18.4 Test description 2660
8.16.18.4.1 Initial conditions 2660
8.16.18.4.2 Test procedure 2661
8.16.18.4.3 Message contents 2664
8.16.18.5 Test requirement 2666
8.16.18A E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth 2667
8.16.18A.1 Test purpose 2667
8.16.18A.2 Test applicability 2667
8.16.18A.3 Minimum conformance requirements 2667
8.16.18A.4 Test description 2667
8.16.18A.4.1 Initial conditions 2667
8.16.18A.4.2 Test procedure 2667
8.16.18A.4.3 Message contents 2668
8.16.18A.5 Test requirement 2668
8.16.19 2668
8.16.20 2668
8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth 2668
8.16.21.1 Test purpose 2668
8.16.21.2 Test applicability 2669
8.16.21.3 Minimum conformance requirements 2669
8.16.21.4 Test description 2669
8.16.21.4.1 Initial conditions 2669
8.16.21.4.2 Test procedure 2670
8.16.21.4.3 Message contents 2670

8.16.21.5 Test requirement 2671
8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth 2672
8.16.22.1 Test purpose 2672
8.16.22.2 Test applicability 2673
8.16.22.3 Minimum conformance requirements 2673
8.16.22.4 Test description 2673
8.16.22.4.1 Initial conditions 2673
8.16.22.4.2 Test procedure 2674
8.16.22.4.3 Message contents 2674
8.16.22.5 Test requirement 2674
8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD 2675
8.16.23.1 Test purpose 2675
8.16.23.2 Test applicability 2676
8.16.23.3 Minimum conformance requirements 2676
8.16.23.4 Test description 2676
8.16.23.4.1 Initial conditions 2676
8.16.23.4.2 Test procedure 2678
8.16.23.4.3 Message contents 2678
8.16.23.5 Test requirement 2679
8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD 2681
8.16.24.1 Test purpose 2681
8.16.24.2 Test applicability 2681
8.16.24.3 Minimum conformance requirements 2681
8.16.24.4 Test description 2681
8.16.24.4.1 Initial conditions 2681
8.16.24.4.2 Test procedure 2682
8.16.24.4.3 Message contents 2682
8.16.24.5 Test requirement 2683
8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD 2685
8.16.25.1 Test purpose 2685
8.16.25.2 Test applicability 2685
8.16.25.3 Minimum conformance requirements 2685
8.16.25.4 Test description 2685
8.16.25.4.1 Initial conditions 2685
8.16.25.4.2 Test procedure 2686
8.16.25.4.3 Message contents 2686
8.16.25.5 Test requirement 2686
8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD 2688
8.16.26.1 Test purpose 2688
8.16.26.2 Test applicability 2688
8.16.26.3 Minimum conformance requirements 2688
8.16.26.4 Test description 2688
8.16.26.4.1 Initial conditions 2688
8.16.26.4.2 Test procedure 2689
8.16.26.4.3 Message contents 2689
8.16.26.5 Test requirement 2689
8.16.27 to 8.16.42 Void 2691
8.16.43 to 8.16.46 2691
8.16.47 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX 2691
8.16.47.1 Test purpose 2691
8.16.47.2 Test applicability 2691
8.16.47.3 Minimum conformance requirements 2691
8.16.47.4 Test description 2692
8.16.47.4.1 Initial conditions 2692
8.16.47.4.2 Test procedure 2693
8.16.47.4.3 Message contents 2695

8.16.47.5 Test requirement 2697
8.16.48 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX 2699
8.16.48.1 Test purpose 2699
8.16.48.2 Test applicability 2699
8.16.48.3 Minimum conformance requirements 2699
8.16.48.4 Test description 2699
8.16.48.4.1 Initial conditions 2699
8.16.48.4.2 Test procedure 2700
8.16.48.4.3 Message contents 2702
8.16.48.5 Test requirement 2704
8.16.49 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX 2706
8.16.49.1 Test purpose 2706
8.16.49.2 Test applicability 2706
8.16.49.3 Minimum conformance requirements 2706
8.16.49.4 Test description 2706
8.16.49.4.1 Initial conditions 2706
8.16.49.4.2 Test procedure 2707
8.16.49.4.3 Message contents 2708
8.16.49.5 Test requirement 2710
8.16.50 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX 2712
8.16.50.1 Test purpose 2712
8.16.50.2 Test applicability 2712
8.16.50.3 Minimum conformance requirements 2712
8.16.50.4 Test description 2712
8.16.50.4.1 Initial conditions 2712
8.16.50.4.2 Test procedure 2713
8.16.50.4.3 Message contents 2715
8.16.50.5 Test requirement 2717
8.16.51 to 8.16.78 Void 2719
8.16.79 to 8.16.82 2719
8.16.83 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes 2719
8.16.83.1 Test purpose 2719
8.16.83.2 Test applicability 2719
8.16.83.3 Minimum conformance requirements 2719
8.16.83.4 Test description 2720
8.16.83.4.1 Initial conditions 2720
8.16.83.4.2 Test procedure 2722
8.16.83.4.3 Message contents 2723
8.16.83.5 Test requirement 2731
8.16.84 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes 2735
8.16.84.1 Test Purpose 2735
8.16.84.2 Test applicability 2735
8.16.84.3 Minimum conformance requirements 2735
8.16.84.4 Test description 2736
8.16.84.4.1 Initial conditions 2736
8.16.84.4.2 Test procedure 2737
8.16.84.4.3 Message contents 2738
8.16.84.5 Test Requirements 2742
8.16.85 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes 2745
8.16.85.1 Test Purpose 2745
8.16.85.2 Test applicability 2745
8.16.85.3 Minimum conformance requirements 2745
8.16.85.4 Test description 2746
8.16.85.4.1 Initial conditions 2746
8.16.85.4.2 Test procedure 2747
8.16.85.4.3 Message contents 2751
8.16.85.5 Test Requirements 2754

8.16.86 3 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes ...2756
8.16.86.1 Test Purpose and Environment ...2756
8.16.86.2 Test applicability ...2756
8.16.86.3 Minimum conformance requirements ...2757
8.16.86.4 Test description ...2758
8.16.86.4.1 Initial conditions ...2758
8.16.86.4.2 Test procedure ...2759
8.16.86.4.3 Message contents ...2762
8.16.86.5 Test Requirements ...2765
8.16.87 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes ...2767
8.16.87.1 Test purpose ...2767
8.16.87.2 Test applicability ...2767
8.16.87.3 Minimum conformance requirements ...2768
8.16.87.4 Test description ...2768
8.16.87.4.1 Initial conditions ...2768
8.16.87.4.2 Test procedure ...2770
8.16.87.4.3 Message contents ...2771
8.16.87.5 Test requirement ...2776
8.16.88 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes ...2781
8.16.88.1 Test purpose ...2781
8.16.88.2 Test applicability ...2781
8.16.88.3 Minimum conformance requirements ...2781
8.16.88.4 Test description ...2781
8.16.88.4.1 Initial conditions ...2781
8.16.88.4.2 Test procedure ...2783
8.16.88.4.3 Message contents ...2784
8.16.88.5 Test requirement ...2788
8.16.89 4 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes ...2794
8.16.89.1 Test Purpose ...2794
8.16.89.2 Test applicability ...2794
8.16.89.3 Minimum conformance requirements ...2794
8.16.89.4 Test description ...2795
8.16.89.4.1 Initial conditions ...2795
8.16.89.4.2 Test procedure ...2796
8.16.89.4.3 Message contents ...2801
8.16.89.5 Test Requirements ...2804
8.16.90 4 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes ...2808
8.16.90.1 Test Purpose ...2808
8.16.90.2 Test applicability ...2808
8.16.90.3 Minimum conformance requirements ...2809
8.16.90.4 Test description ...2810
8.16.90.4.1 Initial conditions ...2810
8.16.90.4.2 Test procedure ...2811
8.16.90.4.3 Message contents ...2817
8.16.90.5 Test Requirements ...2820
8.16.91 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes ...2824
8.16.91.1 Test purpose ...2824
8.16.91.2 Test applicability ...2824
8.16.91.3 Minimum conformance requirements ...2824
8.16.91.4 Test description ...2825
8.16.91.4.1 Initial conditions ...2825
8.16.91.4.2 Test procedure ...2826
8.16.91.4.3 Message contents ...2827
8.16.91.5 Test requirement ...2833
8.16.92 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes ...2838
8.16.92.1 Test purpose ...2838
8.16.92.2 Test applicability ...2838
8.16.92.3 Minimum conformance requirements ...2838

8.16.92.4 Test description 2838
8.16.92.4.1 Initial conditions 2838
8.16.92.4.2 Test procedure 2840
8.16.92.4.3 Message contents 2841
8.16.92.5 Test requirement 2845
8.16.93 5 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes 2850
8.16.93.1 Test Purpose 2850
8.16.93.2 Test applicability 2851
8.16.93.3 Minimum conformance requirements 2851
8.16.93.4 Test description 2852
8.16.93.4.1 Initial conditions 2852
8.16.93.4.2 Test procedure 2853
8.16.93.4.3 Message contents 2858
8.16.93.5 Test Requirements 2861
8.16.94 5 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes 2865
8.16.94.1 Test Purpose 2865
8.16.94.2 Test applicability 2865
8.16.94.3 Minimum conformance requirements 2866
8.16.94.4 Test description 2866
8.16.94.4.1 Initial conditions 2866
8.16.94.4.2 Test procedure 2867
8.16.94.4.3 Message contents 2873
8.16.94.5 Test Requirements 2875
8.16.95 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes 2879
8.16.96 to 8.16.98 2894
8.16.99 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes 2894
8.17 RSTD Measurements for E-UTRAN Carrier Aggregation 2910
8.18 E-UTRAN TDD – HRPD Measurements 2910
8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions 2910
8.18.1.1 Test purpose 2910
8.18.1.2 Test applicability 2910
8.18.1.3 Minimum requirement 2910
8.18.1.4 Test description 2910
8.18.1.4.1 Initial conditions 2910
8.18.1.4.2 Test procedure 2911
8.18.1.4.3 Message contents 2912
8.18.1.5 Test requirement 2915
8.19 E-UTRAN TDD – CDMA2000 1X Measurements 2916
8.19.1 E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions 2916
8.19.1.1 Test purpose 2916
8.19.1.2 Test applicability 2916
8.19.1.3 Minimum conformance requirements 2917
8.19.1.4 Test description 2917
8.19.1.4.1 Initial conditions 2917
8.19.1.4.2 Test procedure 2918
8.19.1.4.3 Message contents 2919
8.19.1.5 Test requirement 2922
8.20 Inter-frequency/RAT Measurements in CA mode 2923
8.20.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells 2923
8.20.1.1 Test purpose 2923
8.20.1.2 Test applicability 2923
8.20.1.3 Minimum conformance requirements 2924
8.20.1.4 Test description 2925
8.20.1.4.1 Initial conditions 2925
8.20.1.4.2 Test procedure 2925
8.20.1.4.3 Message contents 2926
8.20.1.5 Test requirement 2927
8.20.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells 2929

8.20.2.1 Test purpose 2929
8.20.2.2 Test applicability 2929
8.20.2.3 Minimum conformance requirements 2929
8.20.2.4 Test description 2930
8.20.2.4.1 Initial conditions 2930
8.20.2.4.2 Test procedure 2931
8.20.2.4.3 Message contents 2932
8.20.2.5 Test requirement 2933
8.20.2A E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth 2934
8.20.2A.1 Test purpose 2934
8.20.2A.2 Test applicability 2934
8.20.2A.3 Minimum conformance requirements 2934
8.20.2A.4 Test description 2934
8.20.2A.4.1 Initial conditions 2934
8.20.2A.4.2 Test procedure 2935
8.20.2A.4.3 Message contents 2935
8.20.2A.5 Test requirement 2935
8.20.2B E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth 2937
8.20.2B.1 Test purpose 2937
8.20.2B.2 Test applicability 2937
8.20.2B.3 Minimum conformance requirements 2937
8.20.2B.4 Test description 2937
8.20.2B.4.1 Initial conditions 2937
8.20.2B.4.2 Test procedure 2938
8.20.2B.4.3 Message contents 2938
8.20.2B.5 Test requirement 2938
8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions 2940
8.20.3.1 Test purpose 2940
8.20.3.2 Test applicability 2940
8.20.3.3 Minimum conformance requirements 2940
8.20.3.4 Test description 2941
8.20.3.4.1 Initial conditions 2941
8.20.3.4.2 Test procedure 2942
8.20.3.4.3 Message contents 2943
8.20.3.5 Test requirement 2946
8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions 2947
8.20.4.1 Test purpose 2947
8.20.4.2 Test applicability 2947
8.20.4.3 Minimum conformance requirements 2948
8.20.4.4 Test description 2949
8.20.4.4.1 Initial conditions 2949
8.20.4.4.2 Test procedure 2950
8.20.4.4.3 Message contents 2950
8.20.4.5 Test requirement 2953
8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth 2954
8.20.4A.1 Test purpose 2954
8.20.4A.2 Test applicability 2954
8.20.4A.3 Minimum conformance requirements 2955
8.20.4A.4 Test description 2955
8.20.4A.4.1 Initial conditions 2955
8.20.4A.4.2 Test procedure 2955
8.20.4A.4.3 Message contents 2956
8.20.4A.5 Test requirement 2956
8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth 2957
8.20.4B.1 Test purpose 2957
8.20.4B.2 Test applicability 2957
8.20.4B.3 Minimum conformance requirements 2958
8.20.4B.4 Test description 2958

8.20.4B.4.1 Initial conditions 2958
8.20.4B.4.2 Test procedure 2958
8.20.4B.4.3 Message contents 2958
8.20.4B.5 Test requirement 2959
8.21 2961
8.22 E-UTRAN Discovery Signal Measurements 2961
8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal 2961
8.22.1.1 Test purpose 2961
8.22.1.2 Test applicability 2961
8.22.1.3 Minimum conformance requirements 2961
8.22.1.4 Test description 2962
8.22.1.4.1 Initial conditions 2962
8.22.1.4.2 Test procedure 2962
8.22.1.4.3 Message contents 2963
8.22.1.5 Test requirement 2966
8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal 2968
8.22.2.1 Test purpose 2968
8.22.2.2 Test applicability 2968
8.22.2.3 Minimum conformance requirements 2969
8.22.2.4 Test description 2969
8.22.2.4.1 Initial conditions 2969
8.22.2.4.2 Test procedure 2970
8.22.2.4.3 Message contents 2971
8.22.2.5 Test requirement 2974
8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal 2976
8.22.3.1 Test purpose 2976
8.22.3.2 Test applicability 2976
8.22.3.3 Minimum conformance requirements 2977
8.22.3.4 Test description 2978
8.22.3.4.1 Initial conditions 2978
8.22.3.4.2 Test procedure 2978
8.22.3.4.3 Message contents 2979
8.22.3.5 Test requirement 2982
8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal 2984
8.22.4.1 Test purpose 2984
8.22.4.2 Test applicability 2984
8.22.4.3 Minimum conformance requirements 2985
8.22.4.4 Test description 2986
8.22.4.4.1 Initial conditions 2986
8.22.4.4.2 Test procedure 2986
8.22.4.4.3 Message contents 2987
8.22.4.5 Test requirement 2990
8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal 2992
8.22.5.1 Test purpose 2992
8.22.5.2 Test applicability 2993
8.22.5.3 Minimum conformance requirements 2993
8.22.5.4 Test description 2994
8.22.5.4.1 Initial conditions 2994
8.22.5.4.2 Test procedure 2994
8.22.5.4.3 Message contents 2995
8.22.5.5 Test requirement 2999
8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal 3002
8.22.6.1 Test purpose 3002
8.22.6.2 Test applicability 3002
8.22.6.3 Minimum conformance requirements 3002
8.22.6.4 Test description 3003

8.22.6.4.1 Initial conditions 3003
8.22.6.4.2 Test procedure 3003
8.22.6.4.3 Message contents 3004
8.22.6.5 Test requirement 3008
8.22.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal 3011
8.22.7.1 Test purpose 3011
8.22.7.2 Test applicability 3011
8.22.7.3 Minimum conformance requirements 3011
8.22.7.4 Test description 3012
8.22.7.4.1 Initial conditions 3012
8.22.7.4.2 Test procedure 3012
8.22.7.4.3 Message contents 3013
8.22.7.5 Test requirement 3017
8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal 3020
8.22.8.1 Test purpose 3020
8.22.8.2 Test applicability 3020
8.22.8.3 Minimum conformance requirements 3020
8.22.8.4 Test description 3021
8.22.8.4.1 Initial conditions 3021
8.22.8.4.2 Test procedure 3021
8.22.8.4.3 Message contents 3022
8.22.8.5 Test requirement 3026
8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal 3029
8.22.9.1 Test purpose 3029
8.22.9.2 Test applicability 3029
8.22.9.3 Minimum conformance requirements 3029
8.22.9.4 Test description 3030
8.22.9.4.1 Initial conditions 3030
8.22.9.4.2 Test procedure 3031
8.22.9.4.3 Message contents 3032
8.22.9.5 Test requirement 3036
8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal 3037
8.22.10.1 Test purpose 3037
8.22.10.2 Test applicability 3038
8.22.10.3 Minimum conformance requirements 3038
8.22.10.4 Test description 3038
8.22.10.4.1 Initial conditions 3038
8.22.10.4.2 Test procedure 3039
8.22.10.4.3 Message contents 3039
8.22.10.5 Test requirement 3044
8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal 3045
8.22.11.1 Test purpose 3045
8.22.11.2 Test applicability 3046
8.22.11.3 Minimum conformance requirements 3046
8.22.11.4 Test description 3047
8.22.11.4.1 Initial conditions 3047
8.22.11.4.2 Test procedure 3047
8.22.11.4.3 Message contents 3048
8.22.11.5 Test requirement 3052
8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal 3055
8.22.12.1 Test purpose 3055
8.22.12.2 Test applicability 3055
8.22.12.3 Minimum conformance requirements 3055
8.22.12.4 Test description 3055
8.22.12.4.1 Initial conditions 3055
8.22.12.4.2 Test procedure 3056

8.22.12.5 Test requirement 3060
8.23 E-UTRAN Dual Connectivity Measurements 3063
8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC 3063
8.23.1.1 Test purpose 3063
8.23.1.2 Test applicability 3063
8.23.1.3 Minimum conformance requirements 3063
8.23.1.4 Test description 3064
8.23.1.4.1 Initial conditions 3064
8.23.1.4.2 Test procedure 3065
8.23.1.4.3 Message contents 3066
8.23.1.5 Test requirement 3069
8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC 3071
8.23.2.1 Test purpose 3071
8.23.2.2 Test applicability 3071
8.23.2.3 Minimum conformance requirements 3071
8.23.2.4 Test description 3072
8.23.2.4.1 Initial conditions 3072
8.23.2.4.2 Test procedure 3073
8.23.2.4.3 Message contents 3073
8.23.2.5 Test requirement 3074
8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC 3075
8.23.3.1 Test purpose 3075
8.23.3.2 Test applicability 3075
8.23.3.3 Minimum conformance requirements 3075
8.23.3.4 Test description 3077
8.23.3.4.1 Initial conditions 3077
8.23.3.4.2 Test procedure 3077
8.23.3.4.3 Message contents 3078
8.23.3.5 Test requirement 3078
8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC 3080
8.23.4.1 Test purpose 3080
8.23.4.2 Test applicability 3080
8.23.4.3 Minimum conformance requirements 3080
8.23.4.4 Test description 3082
8.23.4.4.1 Initial conditions 3082
8.23.4.4.2 Test procedure 3083
8.23.4.4.3 Message contents 3084
8.23.4.5 Test requirement 3085
8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC 3087
8.23.5.1 Test purpose 3087
8.23.5.2 Test applicability 3088
8.23.5.3 Minimum conformance requirements 3088
8.23.5.4 Test description 3089
8.23.5.4.1 Initial conditions 3089
8.23.5.4.2 Test procedure 3090
8.23.5.4.3 Message contents 3090
8.23.5.5 Test requirement 3090
8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC 3092
8.23.6.1 Test purpose 3092
8.23.6.2 Test applicability 3093
8.23.6.3 Minimum conformance requirements 3093
8.23.6.4 Test description 3094
8.23.6.4.1 Initial conditions 3094
8.23.6.4.2 Test procedure 3095
8.23.6.4.3 Message contents 3095
8.23.6.5 Test requirement 3097
8.23.7 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Synchronous DC 3099
8.23.7.1 Test purpose 3100
8.23.7.2 Test applicability 3100
8.23.7.3 Minimum conformance requirements 3100
8.23.7.4 Test description 3100
8.23.7.4.1 Initial conditions 3100

8.23.7.4.2 Test procedure 3101
8.23.7.4.3 Message contents 3103
8.23.7.5 Test requirement 3103
8.23.8 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Asynchronous DC 3105
8.23.8.1 Test purpose 3105
8.23.8.2 Test applicability 3105
8.23.8.3 Minimum conformance requirements 3105
8.23.8.4 Test description 3106
8.23.8.4.1 Initial conditions 3106
8.23.8.4.2 Test procedure 3107
8.23.8.4.3 Message contents 3108
8.23.8.5 Test requirement 3108
8.23.9 E-UTRAN TDD Addition and Release Delay of known PSCell in Synchronous DC 3110
8.23.9.1 Test purpose 3110
8.23.9.2 Test applicability 3110
8.23.9.3 Minimum conformance requirements 3110
8.23.9.4 Test description 3111
8.23.9.4.1 Initial conditions 3111
8.23.9.4.2 Test procedure 3112
8.23.9.4.3 Message contents 3113
8.23.9.5 Test requirement 3113
8.24 Proximity-based Services 3115
8.24.1 FFS 3115
8.24.2 FFS 3115
8.24.3 E-UTRAN FDD - Initiation/Cease of SLSS Transmission with ProSe Direct Discovery 3115
8.24.3.1 Test purpose 3115
8.24.3.2 Test applicability 3115
8.24.3.3 Minimum conformance requirements 3115
8.24.3.4 Test description 3116
8.24.3.4.1 Initial conditions 3116
8.24.3.4.2 Test procedure 3117
8.24.3.4.3 Message contents 3118
8.24.3.5 Test requirement 3118
8.25 E-UTRAN FDD-WLAN measurements 3119
8.25.1 E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN 3119
8.25.1.1 Test purpose 3119
8.25.1.2 Test applicability 3119
8.25.1.3 Minimum conformance requirements 3119
8.25.1.4 Test description 3120
8.25.1.4.1 Initial conditions 3120
8.25.1.4.2 Test procedure 3121
8.25.1.4.3 Message contents 3122
8.25.1.5 Test requirement 3126
8.25.2 E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN 3128
8.25.2.1 Test purpose 3128
8.25.2.2 Test applicability 3128
8.25.2.3 Minimum conformance requirements 3128
8.25.2.4 Test description 3129
8.25.2.4.1 Initial conditions 3129
8.25.2.4.2 Test procedure 3129
8.25.2.4.3 Message contents 3130
8.25.2.5 Test requirement 3135
8.26 Frame Structure 3 (FS3) 3137
8.26.1 E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell with FDD PCell in non-DRX 3137
8.26.1.1 Test purpose 3137
8.26.1.2 Test applicability 3137
8.26.1.3 Minimum conformance requirements 3137
8.26.1.4 Test description 3138
8.26.1.4.1 Initial conditions 3138
8.26.1.4.2 Test procedure 3139
8.26.1.4.3 Message contents 3141
8.26.1.5 Test requirement 3144

8.26.2 E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell with TDD PCell in non-DRX 3146
8.26.2.1 Test purpose 3146
8.26.2.2 Test applicability 3147
8.26.2.3 Minimum conformance requirements 3147
8.26.2.4 Test description 3147
8.26.2.4.1 Initial conditions 3147
8.26.2.4.2 Test procedure 3147
8.26.2.4.3 Message contents 3149
8.26.2.5 Test requirement 3149
8.26.3 E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX 3151
8.26.3.1 Test purpose 3151
8.26.3.2 Test applicability 3151
8.26.3.3 Minimum conformance requirements 3151
8.26.3.4 Test description 3154
8.26.3.4.1 Initial conditions 3154
8.26.3.4.2 Test procedure 3154
8.26.3.4.3 Message contents 3155
8.26.3.5 Test requirement 3157
8.26.3A E-UTRAN FDD-FS3 3DL Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX 3159
8.26.3A.1 Test purpose 3159
8.26.3A.2 Test applicability 3159
8.26.3A.3 Minimum conformance requirements 3159
8.26.3A.4 Test description 3161
8.26.3A.4.1 Initial conditions 3161
8.26.3A.4.2 Test procedure 3162
8.26.3A.4.3 Message contents 3163
8.26.3A.5 Test requirement 3167
8.26.4 E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX 3169
8.26.4.1 Test purpose 3169
8.26.4.2 Test applicability 3169
8.26.4.3 Minimum conformance requirements 3169
8.26.4.4 Test description 3169
8.26.4.4.1 Initial conditions 3169
8.26.4.4.2 Test procedure 3170
8.26.4.4.3 Message contents 3171
8.26.4.5 Test requirement 3171
8.26.4A E-UTRAN TDD-FS3 3DL Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX 3173
8.26.4A.1 Test purpose 3173
8.26.4A.2 Test applicability 3173
8.26.4A.3 Minimum conformance requirements 3173
8.26.4A.4 Test description 3175
8.26.4A.4.1 Initial conditions 3175
8.26.4A.4.2 Test procedure 3176
8.26.4A.4.3 Message contents 3177
8.26.4A.5 Test requirement 3180
8.26.5 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal 3182
8.26.5.1 Test purpose 3182
8.26.5.2 Test applicability 3182
8.26.5.3 Minimum conformance requirements 3182
8.26.5.4 Test description 3184
8.26.5.4.1 Initial conditions 3184
8.26.5.4.2 Test procedure 3185
8.26.5.4.3 Message contents 3186
8.26.5.5 Test requirement 3187
8.26.5A E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal with 2 SCells 3189
8.26.5A.1 Test purpose 3189

8.26.5A.2 Test applicability 3189
8.26.5A.3 Minimum conformance requirements 3189
8.26.5A.4 Test description 3191
8.26.5A.4.1 Initial conditions 3191
8.26.5A.4.2 Test procedure 3192
8.26.5A.4.3 Message contents 3193
8.26.5A.5 Test requirement 3194
8.26.6 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal 3196
8.26.6.1 Test purpose 3196
8.26.6.2 Test applicability 3196
8.26.6.3 Minimum conformance requirements 3196
8.26.6.4 Test description 3198
8.26.6.4.1 Initial conditions 3198
8.26.6.4.2 Test procedure 3199
8.26.6.4.3 Message contents 3200
8.26.6.5 Test requirement 3200
8.26.6A E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal with 2 SCells 3202
8.26.6A.1 Test purpose 3202
8.26.6A.2 Test applicability 3203
8.26.6A.3 Minimum conformance requirements 3203
8.26.6A.4 Test description 3203
8.26.6A.4.1 Initial conditions 3203
8.26.6A.4.2 Test procedure 3204
8.26.6A.4.3 Message contents 3205
8.26.6A.5 Test requirement 3205
8.26.7 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal 3207
8.26.7.1 Test purpose 3207
8.26.7.2 Test applicability 3207
8.26.7.3 Minimum conformance requirements 3207
8.26.7.4 Test description 3209
8.26.7.4.1 Initial conditions 3209
8.26.7.4.2 Test procedure 3210
8.26.7.4.3 Message contents 3211
8.26.7.5 Test requirement 3213
8.26.8 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal 3215
8.26.8.1 Test purpose 3215
8.26.8.2 Test applicability 3216
8.26.8.3 Minimum conformance requirements 3216
8.26.8.4 Test description 3218
8.26.8.4.1 Initial conditions 3218
8.26.8.4.2 Test procedure 3218
8.26.8.4.3 Message contents 3219
8.26.8.5 Test requirement 3222
8.26.9 E-UTRAN FDD-FS3 Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells 3224
8.26.9.1 Test purpose 3224
8.26.9.2 Test applicability 3224
8.26.9.3 Minimum conformance requirements 3224
8.26.9.4 Test description 3225
8.26.9.4.1 Initial conditions 3225
8.26.9.4.2 Test procedure 3226
8.26.9.4.3 Message contents 3227
8.26.9.5 Test requirement 3230
8.26.10 E-UTRAN TDD-FS3 Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells 3232
8.26.10.1 Test purpose 3232
8.26.10.2 Test applicability 3232
8.26.10.3 Minimum conformance requirements 3232

8.26.10.4 Test description 3233
8.26.10.4.1 Initial conditions 3233
8.26.10.4.2 Test procedure 3234
8.26.10.4.3 Message contents 3235
8.26.10.5 Test requirement 3238

9 Measurement Performance Requirements 3241
9.1 RSRP 3242
9.1.1 FDD Intra frequency RSRP Accuracy 3242
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy 3242
9.1.1.1.1 Test purpose 3242
9.1.1.1.2 Test applicability 3242
9.1.1.1.3 Minimum conformance requirements 3242
9.1.1.1.4 Test description 3243
9.1.1.1.4.1 Initial conditions 3243
9.1.1.1.4.2 Test procedure 3243
9.1.1.1.4.3 Message contents 3243
9.1.1.1.5 Test requirement 3244
9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward) 3246
9.1.1.1_1.1 Test purpose 3246
9.1.1.1_1.2 Test applicability 3246
9.1.1.1_1.3 Minimum conformance requirements 3247
9.1.1.1_1.4 Test description 3247
9.1.1.1_1.4.1 Initial conditions 3247
9.1.1.1_1.4.2 Test procedure 3248
9.1.1.1_1.4.3 Message contents 3248
9.1.1.1_1.5 Test requirement 3248
9.1.1.1_2 FDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis 3250
9.1.1.1_2.1 Test purpose 3250
9.1.1.1_2.2 Test applicability 3251
9.1.1.1_2.3 Minimum conformance requirements 3251
9.1.1.1_2.4 Test description 3252
9.1.1.1_2.4.1 Initial conditions 3252
9.1.1.1_2.4.2 Test procedure 3252
9.1.1.1_2.4.3 Message contents 3252
9.1.1.1_2.5 Test requirement 3253
9.1.1.1_3 FDD Intra Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements 3255
9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP 3265
9.1.1.2.1 Test purpose 3265
9.1.1.2.2 Test applicability 3265
9.1.1.2.3 Minimum conformance requirements 3265
9.1.1.2.4 Test description 3265
9.1.1.2.4.1 Initial conditions 3265
9.1.1.2.4.2 Test procedure 3266
9.1.1.2.4.3 Message contents 3266
9.1.1.2.5 Test requirement 3267
9.1.1.2_2 FDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis 3269
9.1.1.2_2.1 Test purpose 3269
9.1.1.2_2.2 Test applicability 3269
9.1.1.2_2.3 Minimum conformance requirements 3269
9.1.1.2_2.4 Test description 3270
9.1.1.2_2.5 Test requirement 3272
9.1.2 TDD Intra frequency RSRP Accuracy 3274
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy 3274
9.1.2.1.1 Test purpose 3274
9.1.2.1.2 Test applicability 3274
9.1.2.1.3 Minimum conformance requirements 3274
9.1.2.1.4 Test description 3275
9.1.2.1.4.1 Initial conditions 3275
9.1.2.1.4.2 Test procedure 3276
9.1.2.1.5 Test requirement 3277
9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward) 3279

9.1.2.1_1.1 Test purpose 3279
9.1.2.1_1.2 Test applicability 3279
9.1.2.1_1.3 Minimum conformance requirements....3279
9.1.2.1_1.4 Test description 3280
9.1.2.1_1.4.1 Initial conditions 3280
9.1.2.1_1.4.2 Test procedure....3280
9.1.2.1_1.5 Test requirement....3281
9.1.2.1_2 TDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis....3283
9.1.2.1_2.1 Test purpose 3283
9.1.2.1_2.2 Test applicability 3283
9.1.2.1_2.3 Minimum conformance requirements....3283
9.1.2.1_2.4 Test description 3284
9.1.2.1_2.4.1 Initial conditions 3284
9.1.2.1_2.4.2 Test procedure....3285
9.1.2.1_2.5 Test requirement....3286
9.1.2.2 TDD Intra Frequency Relative Accuracy of RSRP....3288
9.1.2.2.1 Test purpose 3288
9.1.2.2.2 Test applicability 3288
9.1.2.2.3 Minimum conformance requirements....3288
9.1.2.2.4 Test description 3289
9.1.2.2.4.1 Initial conditions 3289
9.1.2.2.4.2 Test procedure....3289
9.1.2.2.4.3 Message contents 3290
9.1.2.2.5 Test requirement....3290
9.1.2.2_2 TDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis 3292
9.1.2.2_2.1 Test purpose 3292
9.1.2.2_2.2 Test applicability 3292
9.1.2.2_2.3 Minimum conformance requirements....3292
9.1.2.2_2.4 Test description 3293
9.1.2.2_2.5 Test requirement....3294
9.1.3 FDD Inter frequency RSRP Accuracy....3296
9.1.3.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy....3296
9.1.3.1.1 Test purpose 3296
9.1.3.1.2 Test applicability 3296
9.1.3.1.3 Minimum conformance requirements....3296
9.1.3.1.4 Test description 3297
9.1.3.1.4.1 Initial conditions 3297
9.1.3.1.4.2 Test procedure....3297
9.1.3.1.4.3 Message contents 3298
9.1.3.1.5 Test requirement....3299
9.1.3.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward) 3301
9.1.3.1_1.1 Test purpose 3301
9.1.3.1_1.2 Test applicability 3301
9.1.3.1_1.3 Minimum conformance requirements....3302
9.1.3.1_1.4 Test description 3302
9.1.3.1_1.4.1 Initial conditions 3302
9.1.3.1_1.4.2 Test procedure....3302
9.1.3.1_1.4.3 Message contents 3302
9.1.3.1_1.5 Test requirement....3303
9.1.3.1_2 FDD - FDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis....3304
9.1.3.1_2.1 Test purpose 3304
9.1.3.1_2.2 Test applicability 3305
9.1.3.1_2.3 Minimum conformance requirements....3305
9.1.3.1_2.4 Test description 3305
9.1.3.1_2.5 Test requirement....3307
9.1.3.1_3 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Overlapping Carrier 3309
9.1.3.1_4 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Non-Overlapping Carrier 3320
9.1.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP....3331
9.1.3.2.1 Test purpose 3331
9.1.3.2.2 Test applicability 3331

9.1.3.2.3 Minimum conformance requirements....3331
9.1.3.2.4 Test description....3332
9.1.3.2.4.1 Initial conditions....3332
9.1.3.2.4.2 Test procedure....3332
9.1.3.2.4.3 Message contents....3333
9.1.3.2.5 Test requirement....3334
9.1.3.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)....3336
9.1.3.2_1.1 Test purpose....3336
9.1.3.2_1.2 Test applicability....3336
9.1.3.2_1.3 Minimum conformance requirements....3336
9.1.3.2_1.4 Test description....3337
9.1.3.2_1.4.1 Initial conditions....3337
9.1.3.2_1.4.2 Test procedure....3337
9.1.3.2_1.4.3 Message contents....3337
9.1.3.2_1.5 Test requirement....3337
9.1.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis....3339
9.1.3.2_2.1 Test purpose....3339
9.1.3.2_2.2 Test applicability....3339
9.1.3.2_2.3 Minimum conformance requirements....3339
9.1.3.2_2.4 Test description....3340
9.1.3.2_2.5 Test requirement....3341
9.1.4 TDD Inter frequency RSRP Accuracy....3344
9.1.4.1 TDD - TDD Inter Frequency Absolute RSRP Accuracy....3344
9.1.4.1.1 Test purpose....3344
9.1.4.1.2 Test applicability....3344
9.1.4.1.3 Minimum conformance requirements....3344
9.1.4.1.4 Test description....3345
9.1.4.1.4.1 Initial conditions....3345
9.1.4.1.4.2 Test procedure....3345
9.1.4.1.4.3 Message contents....3346
9.1.4.1.5 Test requirement....3347
9.1.4.1_1 TDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)....3349
9.1.4.1_1.1 Test purpose....3349
9.1.4.1_1.2 Test applicability....3349
9.1.4.1_1.3 Minimum conformance requirements....3349
9.1.4.1_1.4 Test description....3350
9.1.4.1_1.4.1 Initial conditions....3350
9.1.4.1_1.4.2 Test procedure....3350
9.1.4.1_1.4.3 Message contents....3350
9.1.4.1_1.5 Test requirement....3351
9.1.4.1_2 TDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis....3355
9.1.4.1_2.1 Test purpose....3355
9.1.4.1_2.2 Test applicability....3355
9.1.4.1_2.3 Minimum conformance requirements....3355
9.1.4.1_2.4 Test description....3356
9.1.4.1_2.5 Test requirement....3357
9.1.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRP....3359
9.1.4.2.1 Test purpose....3359
9.1.4.2.2 Test applicability....3359
9.1.4.2.3 Minimum conformance requirements....3359
9.1.4.2.4 Test description....3360
9.1.4.2.4.1 Initial conditions....3360
9.1.4.2.4.2 Test procedure....3360
9.1.4.2.4.3 Message contents....3361
9.1.4.2.5 Test requirement....3361
9.1.4.2_1 TDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)....3364
9.1.4.2_1.1 Test purpose....3364
9.1.4.2_1.2 Test applicability....3364
9.1.4.2_1.3 Minimum conformance requirements....3364
9.1.4.2_1.4 Test description....3365
9.1.4.2_1.4.1 Initial conditions....3365
9.1.4.2_1.4.2 Test procedure....3365

9.1.4.2_1.4.3 Message contents 3365
9.1.4.2_1.5 Test requirement 3366
9.1.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis 3369
9.1.4.2_2.1 Test purpose 3369
9.1.4.2_2.2 Test applicability 3369
9.1.4.2_2.3 Minimum conformance requirements 3369
9.1.4.2_2.4 Test description 3370
9.1.4.2_2.5 Test requirement 3371
9.1.5 FDD - TDD Inter frequency RSRP Accuracy 3374
9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy 3374
9.1.5.1.1 Test purpose 3374
9.1.5.1.2 Test applicability 3374
9.1.5.1.3 Minimum conformance requirements 3374
9.1.5.1.4 Test description 3375
9.1.5.1.4.1 Initial conditions 3375
9.1.5.1.4.2 Test procedure 3376
9.1.5.1.4.3 Message contents 3376
9.1.5.1.5 Test requirement 3377
9.1.5.1_1 FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward) 3380
9.1.5.1_1.1 Test purpose 3380
9.1.5.1_1.2 Test applicability 3380
9.1.5.1_1.3 Minimum conformance requirements 3380
9.1.5.1_1.4 Test description 3381
9.1.5.1_1.4.1 Initial conditions 3381
9.1.5.1_1.4.2 Test procedure 3381
9.1.5.1_1.4.3 Message contents 3381
9.1.5.1_1.5 Test requirement 3381
9.1.5.1_2 FDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis 3384
9.1.5.1_2.1 Test purpose 3384
9.1.5.1_2.2 Test applicability 3384
9.1.5.1_2.3 Minimum conformance requirements 3384
9.1.5.1_2.4 Test description 3385
9.1.5.1_2.4.2 Test procedure 3385
9.1.5.1_2.4.3 Message contents 3385
9.1.5.1_2.5 Test requirement 3386
9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP 3389
9.1.5.2.1 Test purpose 3389
9.1.5.2.2 Test applicability 3389
9.1.5.2.3 Minimum conformance requirements 3389
9.1.5.2.4 Test description 3390
9.1.5.2.4.1 Initial conditions 3390
9.1.5.2.4.2 Test procedure 3390
9.1.5.2.4.3 Message contents 3391
9.1.5.2.5 Test requirement 3391
9.1.5.2_1 FDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward) 3394
9.1.5.2_1.1 Test purpose 3394
9.1.5.2_1.2 Test applicability 3394
9.1.5.2_1.3 Minimum conformance requirements 3394
9.1.5.2_1.4 Test description 3395
9.1.5.2_1.4.1 Initial conditions 3395
9.1.5.2_1.4.2 Test procedure 3395
9.1.5.2_1.4.3 Message contents 3395
9.1.5.2_1.5 Test requirement 3395
9.1.5.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis 3398
9.1.5.2_2.1 Test purpose 3398
9.1.5.2_2.2 Test applicability 3398
9.1.5.2_2.3 Minimum conformance requirements 3398
9.1.5.2_2.4 Test description 3399
9.1.5.2_2.5 Test requirement 3400
9.1.6 FDD RSRP Accuracy E-UTRA for Carrier Aggregation 3403
9.1.6.1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation 3403
9.1.6.1.1 Test purpose 3403

9.1.6.1.2 Test applicability 3403
9.1.6.1.3 Minimum conformance requirements 3403
9.1.6.1.4 Test description 3404
9.1.6.1.4.1 Initial conditions 3404
9.1.6.1.4.2 Test procedure 3405
9.1.6.1.4.3 Message contents 3405
9.1.6.1.5 Test requirement 3406
9.1.6.1_1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward) 3408
9.1.6.1_1.1 Test purpose 3408
9.1.6.1_1.2 Test applicability 3408
9.1.6.1_1.3 Minimum conformance requirements 3408
9.1.6.1_1.4 Test description 3409
9.1.6.1_1.4.1 Initial conditions 3409
9.1.6.1_1.4.2 Test procedure 3409
9.1.6.1_1.4.3 Message contents 3409
9.1.6.1_1.5 Test requirement 3409
9.1.6.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation 3411
9.1.6.2.1 Test purpose 3411
9.1.6.2.2 Test applicability 3411
9.1.6.2.3 Minimum conformance requirements 3412
9.1.6.2.4 Test description 3413
9.1.6.2.4.1 Initial conditions 3413
9.1.6.2.4.2 Test procedure 3413
9.1.6.2.4.3 Message contents 3414
9.1.6.2.5 Test requirement 3414
9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward) 3416
9.1.6.2_1.1 Test purpose 3416
9.1.6.2_1.2 Test applicability 3416
9.1.6.2_1.3 Minimum conformance requirements 3416
9.1.6.2_1.4 Test description 3418
9.1.6.2_1.4.1 Initial conditions 3418
9.1.6.2_1.4.2 Test procedure 3418
9.1.6.2_1.4.3 Message contents 3418
9.1.6.2_1.5 Test requirement 3418
9.1.7 TDD RSRP Accuracy E-UTRA for Carrier Aggregation 3420
9.1.7.1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation 3420
9.1.7.1.1 Test purpose 3420
9.1.7.1.2 Test applicability 3420
9.1.7.1.3 Minimum conformance requirements 3421
9.1.7.1.4 Test description 3422
9.1.7.1.4.1 Initial conditions 3422
9.1.7.1.4.2 Test procedure 3422
9.1.7.1.4.3 Message contents 3423
9.1.7.1.5 Test requirement 3423
9.1.7.1_1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward) 3425
9.1.7.1_1.1 Test purpose 3425
9.1.7.1_1.2 Test applicability 3425
9.1.7.1_1.3 Minimum conformance requirements 3425
9.1.7.1_1.4 Test description 3426
9.1.7.1_1.4.1 Initial conditions 3426
9.1.7.1_1.4.2 Test procedure 3426
9.1.7.1_1.4.3 Message contents 3426
9.1.7.1_1.5 Test requirement 3427
9.1.7.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation 3429
9.1.7.2.1 Test purpose 3429
9.1.7.2.2 Test applicability 3429
9.1.7.2.3 Minimum conformance requirements 3429
9.1.7.2.4 Test description 3431
9.1.7.2.4.1 Initial conditions 3431
9.1.7.2.4.2 Test procedure 3431
9.1.7.2.4.3 Message contents 3432
9.1.7.2.5 Test requirement 3432

9.1.7.2_1 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward) 3434
9.1.7.2_1.1 Test purpose 3434
9.1.7.2_1.2 Test applicability 3434
9.1.7.2_1.3 Minimum conformance requirements....3434
9.1.7.2_1.4 Test description 3436
9.1.7.2_1.4.1 Initial conditions 3436
9.1.7.2_1.4.2 Test procedure....3436
9.1.7.2_1.4.3 Message contents 3436
9.1.7.2_1.5 Test requirement....3436
9.1.8 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)....3438
9.1.8.1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)....3438
9.1.8.1.1 Test purpose 3438
9.1.8.1.2 Test applicability 3438
9.1.8.1.3 Minimum conformance requirements....3438
9.1.8.1.4 Test description 3439
9.1.8.1.4.1 Initial conditions 3439
9.1.8.1.4.2 Test procedure....3440
9.1.8.1.4.3 Message contents 3441
9.1.8.1.5 Test requirement....3442
9.1.8.1_1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward) 3444
9.1.8.1_1.1 Test purpose 3444
9.1.8.1_1.2 Test applicability 3445
9.1.8.1_1.3 Minimum conformance requirements....3445
9.1.8.1_1.4 Test description 3446
9.1.8.1_1.4.1 Initial conditions 3446
9.1.8.1_1.4.2 Test procedure....3446
9.1.8.1_1.4.3 Message contents 3446
9.1.8.1_1.5 Test requirement....3446
9.1.8.2 FDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)....3449
9.1.8.2.1 Test purpose 3449
9.1.8.2.2 Test applicability 3449
9.1.8.2.3 Minimum conformance requirements....3449
9.1.8.2.4 Test description 3450
9.1.8.2.4.1 Initial conditions 3450
9.1.8.2.4.2 Test procedure....3451
9.1.8.2.4.3 Message contents 3452
9.1.8.2.5 Test requirement....3453
9.1.9 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)....3455
9.1.9.1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)....3455
9.1.9.1.1 Test purpose 3455
9.1.9.1.2 Test applicability 3455
9.1.9.1.3 Minimum conformance requirements....3455
9.1.9.1.4 Test description 3456
9.1.9.1.4.1 Initial conditions 3456
9.1.9.1.4.2 Test procedure....3457
9.1.9.1.4.3 Message contents 3458
9.1.9.1.5 Test requirement....3459
9.1.9.1_1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward) 3461
9.1.9.1_1.1 Test purpose 3461
9.1.9.1_1.2 Test applicability 3461
9.1.9.1_1.3 Minimum conformance requirements....3461
9.1.9.1_1.4 Test description 3462
9.1.9.1_1.4.1 Initial conditions 3462
9.1.9.1_1.4.2 Test procedure....3462
9.1.9.1_1.4.3 Message contents 3463

9.1.9.1_1.5 Test requirement 3463
9.1.9.2 TDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) 3465
9.1.9.2.1 Test purpose 3465
9.1.9.2.2 Test applicability 3465
9.1.9.2.3 Minimum conformance requirements 3465
9.1.9.2.4 Test description 3466
9.1.9.2.4.1 Initial conditions 3466
9.1.9.2.4.2 Test procedure 3467
9.1.9.2.4.3 Message contents 3468
9.1.9.2.5 Test requirement 3469
9.1.10 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3471
9.1.10.1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3471
9.1.10.1.1 Test purpose 3471
9.1.10.1.2 Test applicability 3471
9.1.10.1.3 Minimum conformance requirements 3471
9.1.10.1.4 Test description 3472
9.1.10.1.5 Test requirement 3475
9.1.10.1_1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) 3478
9.1.10.1_1.1 Test purpose 3478
9.1.10.1_1.2 Test applicability 3478
9.1.10.1_1.3 Minimum conformance requirements 3478
9.1.10.1_1.4 Test description 3479
9.1.10.1_1.5 Test requirement 3480
9.1.10.2 FDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3483
9.1.10.2.1 Test purpose 3483
9.1.10.2.2 Test applicability 3483
9.1.10.2.3 Minimum conformance requirements 3483
9.1.10.2.4 Test description 3484
9.1.10.2.4.1 Initial conditions 3484
9.1.10.2.4.2 Test procedure 3485
9.1.10.2.4.3 Message contents 3485
9.1.10.2.5 Test requirement 3487
9.1.11 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3489
9.1.11.1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3489
9.1.11.1.1 Test purpose 3489
9.1.11.1.2 Test applicability 3489
9.1.11.1.3 Minimum conformance requirements 3490
9.1.11.1.4 Test description 3491
9.1.11.1.4.1 Initial conditions 3491
9.1.11.1.4.2 Test procedure 3491
9.1.11.1.4.3 Message contents 3491
9.1.11.1.5 Test requirement 3493
9.1.11.1_1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) 3496
9.1.11.1_1.1 Test purpose 3496
9.1.11.1_1.2 Test applicability 3496
9.1.11.1_1.3 Minimum conformance requirements 3496
9.1.11.1_1.4 Test description 3497
9.1.11.1_1.4.1 Initial conditions 3497
9.1.11.1_1.4.2 Test procedure 3498
9.1.11.1_1.4.3 Message contents 3498
9.1.11.1_1.5 Test requirement 3498
9.1.11.2 TDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3500
9.1.11.2.1 Test purpose 3500

9.1.11.2.2 Test applicability 3500
9.1.11.2.3 Minimum conformance requirements....3500
9.1.11.2.4 Test description 3501
9.1.11.2.4.1 Initial conditions 3501
9.1.11.2.4.2 Test procedure....3501
9.1.11.2.4.3 Message contents 3502
9.1.11.2.5 Test requirement....3504
9.1.12 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3506
9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3506
9.1.12.1.1 Test purpose 3506
9.1.12.1.2 Test applicability 3506
9.1.12.1.3 Minimum conformance requirements....3506
9.1.12.1.4 Test description 3507
9.1.12.1.4.1 Initial conditions 3507
9.1.12.1.4.2 Test procedure....3508
9.1.12.1.4.3 Message contents 3508
9.1.12.1.5 Test requirement....3509
9.1.12.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)....3510
9.1.12.1_1.1 Test purpose 3510
9.1.12.1_1.2 Test applicability 3510
9.1.12.1_1.3 Minimum conformance requirements....3510
9.1.12.1_1.4 Test description 3511
9.1.12.1_1.4.1 Initial conditions 3511
9.1.12.1_1.4.2 Test procedure....3511
9.1.12.1_1.4.3 Message contents 3512
9.1.12.1_1.5 Test requirement....3512
9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3513
9.1.12.2.1 Test purpose 3513
9.1.12.2.2 Test applicability 3513
9.1.12.2.3 Minimum conformance requirements....3513
9.1.12.2.4 Test description 3515
9.1.12.2.4.1 Initial conditions 3515
9.1.12.2.4.2 Test procedure....3515
9.1.12.2.4.3 Message contents 3516
9.1.12.2.5 Test requirement....3516
9.1.12.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)....3517
9.1.12.2_1.1 Test purpose 3517
9.1.12.2_1.2 Test applicability 3517
9.1.12.2_1.3 Minimum conformance requirements....3517
9.1.12.2_1.4 Test description 3517
9.1.12.2_1.4.1 Initial conditions 3517
9.1.12.2_1.4.2 Test procedure....3517
9.1.12.2_1.4.3 Message contents 3517
9.1.12.2_1.5 Test requirement....3517
9.1.13 TDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3519
9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3519
9.1.13.1.1 Test purpose 3519
9.1.13.1.2 Test applicability 3519
9.1.13.1.3 Minimum conformance requirements....3519
9.1.13.1.4 Test description 3520
9.1.13.1.4.1 Initial conditions 3520
9.1.13.1.4.2 Test procedure....3520
9.1.13.1.4.3 Message contents 3521
9.1.13.1.5 Test requirement....3521
9.1.13.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)....3522
9.1.13.1_1.1 Test purpose 3522
9.1.13.1_1.2 Test applicability 3522
9.1.13.1_1.3 Minimum conformance requirements....3522
9.1.13.1_1.4 Test description 3523

9.1.13.1_1.4.1 Initial conditions 3523
9.1.13.1_1.4.2 Test procedure....3523
9.1.13.1_1.4.3 Message contents 3523
9.1.13.1_1.5 Test requirement....3524
9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz 3525
9.1.13.2.1 Test purpose 3525
9.1.13.2.2 Test applicability 3525
9.1.13.2.3 Minimum conformance requirements....3525
9.1.13.2.4 Test description 3526
9.1.13.2.4.1 Initial conditions 3526
9.1.13.2.4.2 Test procedure....3527
9.1.13.2.4.3 Message contents 3527
9.1.13.2.5 Test requirement....3527
9.1.13.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)....3528
9.1.13.2_1.1 Test purpose 3528
9.1.13.2_1.2 Test applicability 3528
9.1.13.2_1.3 Minimum conformance requirements....3528
9.1.13.2_1.4 Test description 3529
9.1.13.2_1.4.1 Initial conditions 3529
9.1.13.2_1.4.2 Test procedure....3529
9.1.13.2_1.4.3 Message contents 3529
9.1.13.2_1.5 Test requirement....3529
9.1.14 FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 3530
9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)....3530
9.1.14.1.1 Test purpose 3530
9.1.14.1.2 Test applicability 3530
9.1.14.1.3 Minimum conformance requirements....3530
9.1.14.1.4 Test description 3531
9.1.14.1.4.1 Initial conditions 3531
9.1.14.1.4.2 Test procedure....3533
9.1.14.1.4.3 Message contents 3533
9.1.14.1.5 Test requirement....3535
9.1.14.1_1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)....3538
9.1.14.1_1.1 Test purpose 3538
9.1.14.1_1.2 Test applicability 3538
9.1.14.1_1.3 Minimum conformance requirements....3538
9.1.14.1_1.4 Test description 3539
9.1.14.1_1.4.1 Initial conditions 3539
9.1.14.1_1.4.2 Test procedure....3539
9.1.14.1_1.4.3 Message contents 3539
9.1.14.1_1.5 Test requirement....3539
9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)....3541
9.1.14.2.1 Test purpose 3542
9.1.14.2.2 Test applicability 3542
9.1.14.2.3 Minimum conformance requirements....3542
9.1.14.2.4 Test description 3543
9.1.14.2.4.1 Initial conditions 3543
9.1.14.2.4.2 Test procedure....3544
9.1.14.2.4.3 Message contents 3545
9.1.14.2.5 Test requirement....3546
9.1.15 TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 3548
9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)....3548
9.1.15.1.1 Test purpose 3548
9.1.15.1.2 Test applicability 3548

9.1.15.1.3 Minimum conformance requirements....3548
9.1.15.1.4 Test description....3549
9.1.15.1.4.1 Initial conditions....3549
9.1.15.1.4.2 Test procedure....3551
9.1.15.1.4.3 Message contents....3552
9.1.15.1.5 Test requirement....3553
9.1.15.1_1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)....3555
9.1.15.1_1.1 Test purpose....3555
9.1.15.1_1.2 Test applicability....3555
9.1.15.1_1.3 Minimum conformance requirements....3555
9.1.15.1_1.4 Test description....3556
9.1.15.1_1.4.1 Initial conditions....3556
9.1.15.1_1.4.2 Test procedure....3556
9.1.15.1_1.4.3 Message contents....3557
9.1.15.1_1.5 Test requirement....3557
9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)....3558
9.1.15.2.1 Test purpose....3558
9.1.15.2.2 Test applicability....3559
9.1.15.2.3 Minimum conformance requirements....3559
9.1.15.2.4 Test description....3560
9.1.15.2.4.1 Initial conditions....3560
9.1.15.2.4.2 Test procedure....3561
9.1.15.2.4.3 Message contents....3562
9.1.15.2.5 Test requirement....3563
9.1.16 FDD Intra frequency RSRP Accuracy for 5MHz Bandwidth....3565
9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth....3565
9.1.16.1.1 Test purpose....3565
9.1.16.1.2 Test applicability....3565
9.1.16.1.3 Minimum conformance requirements....3565
9.1.16.1.4 Test description....3566
9.1.16.1.4.1 Initial conditions....3566
9.1.16.1.4.2 Test procedure....3566
9.1.16.1.4.3 Message contents....3566
9.1.16.1.5 Test requirement....3567
9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)....3568
9.1.16.1_1.1 Test purpose....3568
9.1.16.1_1.2 Test applicability....3568
9.1.16.1_1.3 Minimum conformance requirements....3568
9.1.16.1_1.4 Test description....3569
9.1.16.1_1.4.1 Initial conditions....3569
9.1.16.1_1.4.2 Test procedure....3569
9.1.16.1_1.4.3 Message contents....3569
9.1.16.1_1.5 Test requirement....3570
9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth....3571
9.1.16.2.1 Test purpose....3571
9.1.16.2.2 Test applicability....3571
9.1.16.2.3 Minimum conformance requirements....3571
9.1.16.2.4 Test description....3572
9.1.16.2.4.1 Initial conditions....3572
9.1.16.2.4.2 Test procedure....3572
9.1.16.2.4.3 Message contents....3572
9.1.16.2.5 Test requirement....3572
9.1.17 FDD Inter frequency RSRP Accuracy for 5MHz Bandwidth....3574
9.1.17.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth....3574
9.1.17.1.1 Test purpose....3574
9.1.17.1.2 Test applicability....3574
9.1.17.1.3 Minimum conformance requirements....3574
9.1.17.1.4 Test description....3575
9.1.17.1.4.1 Initial conditions....3575

9.1.17.1.4.2 Test procedure....3575
9.1.17.1.4.3 Message contents....3575
9.1.17.1.5 Test requirement....3575
9.1.17.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)....3577
9.1.17.1_1.1 Test purpose....3577
9.1.17.1_1.2 Test applicability....3577
9.1.17.1_1.3 Minimum conformance requirements....3577
9.1.17.1_1.4 Test description....3578
9.1.17.1_1.4.1 Initial conditions....3578
9.1.17.1_1.4.2 Test procedure....3578
9.1.17.1_1.4.3 Message contents....3578
9.1.17.1_1.5 Test requirement....3578
9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth....3580
9.1.17.2.1 Test purpose....3580
9.1.17.2.2 Test applicability....3580
9.1.17.2.3 Minimum conformance requirements....3580
9.1.17.2.4 Test description....3581
9.1.17.2.4.1 Initial conditions....3581
9.1.17.2.4.2 Test procedure....3581
9.1.17.2.4.3 Message contents....3581
9.1.17.2.5 Test requirement....3581
9.1.17.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth (Rel-12 and forward)....3583
9.1.17.2_1.1 Test purpose....3583
9.1.17.2_1.2 Test applicability....3583
9.1.17.2_1.3 Minimum conformance requirements....3583
9.1.17.2_1.4 Test description....3584
9.1.17.2_1.4.1 Initial conditions....3584
9.1.17.2_1.4.2 Test procedure....3584
9.1.17.2_1.4.3 Message contents....3584
9.1.17.2_1.5 Test requirement....3584
9.1.18 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz....3586
9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz....3586
9.1.18.1.1 Test purpose....3586
9.1.18.1.2 Test applicability....3586
9.1.18.1.3 Minimum conformance requirements....3586
9.1.18.1.4 Test description....3586
9.1.18.1.4.1 Initial conditions....3586
9.1.18.1.4.2 Test procedure....3587
9.1.18.1.4.3 Message contents....3587
9.1.18.1.5 Test requirement....3587
9.1.18.1_1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)....3589
9.1.18.1_1.1 Test purpose....3589
9.1.18.1_1.2 Test applicability....3589
9.1.18.1_1.3 Minimum conformance requirements....3589
9.1.18.1_1.4 Test description....3589
9.1.18.1_1.4.1 Initial conditions....3589
9.1.18.1_1.4.2 Test procedure....3589
9.1.18.1_1.4.3 Message contents....3589
9.1.18.1_1.5 Test requirement....3589
9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz....3590
9.1.18.2.1 Test purpose....3590
9.1.18.2.2 Test applicability....3591
9.1.18.2.3 Minimum conformance requirements....3591
9.1.18.2.4 Test description....3591
9.1.18.2.4.1 Initial conditions....3591
9.1.18.2.4.2 Test procedure....3591
9.1.18.2.4.3 Message contents....3591
9.1.18.2.5 Test requirement....3591

9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward) 3592
9.1.18.2_1.1 Test purpose 3592
9.1.18.2_1.2 Test applicability 3593
9.1.18.2_1.3 Minimum conformance requirements 3593
9.1.18.2_1.4 Test description 3593
9.1.18.2_1.4.1 Initial conditions 3593
9.1.18.2_1.4.2 Test procedure 3593
9.1.18.2_1.4.3 Message contents 3593
9.1.18.2_1.5 Test requirement 3593
9.1.19 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz 3595
9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz 3595
9.1.19.1.1 Test purpose 3595
9.1.19.1.2 Test applicability 3595
9.1.19.1.3 Minimum conformance requirements 3595
9.1.19.1.4 Test description 3595
9.1.19.1.4.1 Initial conditions 3595
9.1.19.1.4.2 Test procedure 3596
9.1.19.1.4.3 Message contents 3596
9.1.19.1.5 Test requirement 3596
9.1.19.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward) 3597
9.1.19.1_1.1 Test purpose 3597
9.1.19.1_1.2 Test applicability 3597
9.1.19.1_1.3 Minimum conformance requirements 3597
9.1.19.1_1.4 Test description 3597
9.1.19.1_1.4.1 Initial conditions 3597
9.1.19.1_1.4.2 Test procedure 3597
9.1.19.1_1.4.3 Message contents 3598
9.1.19.1_1.5 Test requirement 3598
9.1.19.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz 3599
9.1.19.2.1 Test purpose 3599
9.1.19.2.2 Test applicability 3599
9.1.19.2.3 Minimum conformance requirements 3599
9.1.19.2.4 Test description 3599
9.1.19.2.4.1 Initial conditions 3599
9.1.19.2.4.2 Test procedure 3599
9.1.19.2.4.3 Message contents 3599
9.1.19.2.5 Test requirement 3600
9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward) 3601
9.1.19.2_1.1 Test purpose 3601
9.1.19.2_1.2 Test applicability 3601
9.1.19.2_1.3 Minimum conformance requirements 3601
9.1.19.2_1.4 Test description 3601
9.1.19.2_1.4.1 Initial conditions 3601
9.1.19.2_1.4.2 Test procedure 3601
9.1.19.2_1.4.3 Message contents 3601
9.1.19.2_1.5 Test requirement 3601
9.1.20 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth 3602
9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth 3602
9.1.20.1.1 Test purpose 3602
9.1.20.1.2 Test applicability 3603
9.1.20.1.3 Minimum conformance requirements 3603
9.1.20.1.4 Test description 3603
9.1.20.1.4.1 Initial conditions 3603
9.1.20.1.4.2 Test procedure 3603
9.1.20.1.4.3 Message contents 3603
9.1.20.1.5 Test requirement 3604
9.1.20.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward) 3605
9.1.20.1_1.1 Test purpose 3605

9.1.20.1_1.2 Test applicability 3605
9.1.20.1_1.3 Minimum conformance requirements 3605
9.1.20.1_1.4 Test description 3605
9.1.20.1_1.4.1 Initial conditions 3605
9.1.20.1_1.4.2 Test procedure 3605
9.1.20.1_1.4.3 Message contents 3606
9.1.20.1_1.5 Test requirement 3606
9.1.20.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth 3607
9.1.20.2.1 Test purpose 3607
9.1.20.2.2 Test applicability 3607
9.1.20.2.3 Minimum conformance requirements 3607
9.1.20.2.4 Test description 3607
9.1.20.2.4.1 Initial conditions 3607
9.1.20.2.4.2 Test procedure 3608
9.1.20.2.4.3 Message contents 3608
9.1.20.2.5 Test requirement 3608
9.1.20.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward) 3609
9.1.20.2_1.1 Test purpose 3610
9.1.20.2_1.2 Test applicability 3610
9.1.20.2_1.3 Minimum conformance requirements 3610
9.1.20.2_1.4 Test description 3610
9.1.20.2_1.4.1 Initial conditions 3610
9.1.20.2_1.4.2 Test procedure 3610
9.1.20.2_1.4.3 Message contents 3610
9.1.20.2_1.5 Test requirement 3610
9.1.21 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz 3611
9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz 3611
9.1.21.1.1 Test purpose 3611
9.1.21.1.2 Test applicability 3611
9.1.21.1.3 Minimum conformance requirements 3611
9.1.21.1.4 Test description 3612
9.1.21.1.4.1 Initial conditions 3612
9.1.21.1.4.2 Test procedure 3612
9.1.21.1.4.3 Message contents 3612
9.1.21.1.5 Test requirement 3612
9.1.21.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward) 3613
9.1.21.1_1.1 Test purpose 3613
9.1.21.1_1.2 Test applicability 3614
9.1.21.1_1.3 Minimum conformance requirements 3614
9.1.21.1_1.4 Test description 3614
9.1.21.1_1.4.1 Initial conditions 3614
9.1.21.1_1.4.2 Test procedure 3614
9.1.21.1_1.4.3 Message contents 3614
9.1.21.1_1.5 Test requirement 3614
9.1.21.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz 3615
9.1.21.2.1 Test purpose 3615
9.1.21.2.2 Test applicability 3615
9.1.21.2.3 Minimum conformance requirements 3615
9.1.21.2.4 Test description 3615
9.1.21.2.4.1 Initial conditions 3615
9.1.21.2.4.2 Test procedure 3616
9.1.21.2.4.3 Message contents 3616
9.1.21.2.5 Test requirement 3616
9.1.21.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward) 3617
9.1.21.2_1.1 Test purpose 3617
9.1.21.2_1.2 Test applicability 3617
9.1.21.2_1.3 Minimum conformance requirements 3618
9.1.21.2_1.4 Test description 3618
9.1.21.2_1.4.1 Initial conditions 3618

9.1.21.2_1.4.2 Test procedure....3618
9.1.21.2_1.4.3 Message contents....3618
9.1.21.2_1.5 Test requirement....3618
9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD....3619
9.1.22.1 Test purpose....3619
9.1.22.2 Test applicability....3619
9.1.22.3 Minimum conformance requirements....3619
9.1.22.4 Test description....3621
9.1.22.4.1 Initial conditions....3621
9.1.22.4.2 Test procedure....3622
9.1.22.4.3 Message contents....3622
9.1.22.5 Test requirement....3623
9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD....3626
9.1.23.1 Test purpose....3626
9.1.23.2 Test applicability....3626
9.1.23.3 Minimum conformance requirements....3627
9.1.23.4 Test description....3629
9.1.23.4.1 Initial conditions....3629
9.1.23.4.2 Test procedure....3629
9.1.23.4.3 Message contents....3630
9.1.23.5 Test requirement....3630
9.1.24 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz....3633
9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz....3633
9.1.24.1.1 Test purpose....3633
9.1.24.1.2 Test applicability....3633
9.1.24.1.3 Minimum conformance requirements....3633
9.1.24.1.4 Test description....3634
9.1.24.1.4.1 Initial conditions....3634
9.1.24.1.4.2 Test procedure....3634
9.1.24.1.4.3 Message contents....3634
9.1.24.1.5 Test requirement....3634
9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)....3636
9.1.24.1_1.1 Test purpose....3636
9.1.24.1_1.2 Test applicability....3636
9.1.24.1_1.3 Minimum conformance requirements....3636
9.1.24.1_1.4 Test description....3636
9.1.24.1_1.4.1 Initial conditions....3636
9.1.24.1_1.4.2 Test procedure....3636
9.1.24.1_1.4.3 Message contents....3636
9.1.24.1_1.5 Test requirement....3637
9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz....3638
9.1.24.2.1 Test purpose....3638
9.1.24.2.2 Test applicability....3638
9.1.24.2.3 Minimum conformance requirements....3638
9.1.24.2.4 Test description....3638
9.1.24.2.4.1 Initial conditions....3638
9.1.24.2.4.2 Test procedure....3638
9.1.24.2.4.3 Message contents....3638
9.1.24.2.5 Test requirement....3639
9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)....3640
9.1.24.2_1.1 Test purpose....3640
9.1.24.2_1.2 Test applicability....3640
9.1.24.2_1.3 Minimum conformance requirements....3640
9.1.24.2_1.4 Test description....3640
9.1.24.2_1.4.1 Initial conditions....3640
9.1.24.2_1.4.2 Test procedure....3640
9.1.24.2_1.4.3 Message contents....3640
9.1.24.2_1.5 Test requirement....3640
9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal....3642
9.1.25.1 Test purpose....3642

9.1.25.2 Test applicability 3642
9.1.25.3 Minimum conformance requirements 3642
9.1.25.4 Test description 3643
9.1.25.4.1 Initial conditions 3643
9.1.25.4.2 Test procedure 3644
9.1.25.4.3 Message contents 3644
9.1.25.5 Test requirement 3645
9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal 3647
9.1.26.1 Test purpose 3647
9.1.26.2 Test applicability 3647
9.1.26.3 Minimum conformance requirements 3647
9.1.26.4 Test description 3648
9.1.26.4.1 Initial conditions 3648
9.1.26.4.2 Test procedure 3648
9.1.26.4.3 Message contents 3648
9.1.26.5 Test requirement 3649
9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal 3651
9.1.27.1 Test purpose 3651
9.1.27.2 Test applicability 3651
9.1.27.3 Minimum conformance requirements 3652
9.1.27.4 Test description 3653
9.1.27.4.1 Initial conditions 3653
9.1.27.4.2 Test procedure 3654
9.1.27.4.3 Message contents 3654
9.1.27.5 Test requirement 3655
9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal 3658
9.1.28.1 Test purpose 3658
9.1.28.2 Test applicability 3658
9.1.28.3 Minimum conformance requirements 3658
9.1.28.4 Test description 3658
9.1.28.4.1 Initial conditions 3658
9.1.28.4.2 Test procedure 3658
9.1.28.4.3 Message contents 3658
9.1.28.5 Test requirement 3659
9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal 3662
9.1.29.1 Test purpose 3662
9.1.29.2 Test applicability 3662
9.1.29.3 Minimum conformance requirements 3662
9.1.29.4 Test description 3664
9.1.29.4.1 Initial conditions 3664
9.1.29.4.2 Test procedure 3665
9.1.29.4.3 Message contents 3665
9.1.29.5 Test requirement 3666
9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal 3670
9.1.30.1 Test purpose 3670
9.1.30.2 Test applicability 3670
9.1.30.3 Minimum conformance requirements 3670
9.1.30.4 Test description 3670
9.1.30.4.1 Initial conditions 3670
9.1.30.4.2 Test procedure 3670
9.1.30.4.3 Message contents 3670
9.1.30.5 Test requirement 3672
9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal 3674
9.1.31.1 Test purpose 3674
9.1.31.2 Test applicability 3674
9.1.31.3 Minimum conformance requirements 3675
9.1.31.4 Test description 3676
9.1.31.4.1 Initial conditions 3676
9.1.31.4.2 Test procedure 3677
9.1.31.4.3 Message contents 3677
9.1.31.5 Test requirement 3678

9.1.32 TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal....3681
9.1.32.1 Test purpose....3681
9.1.32.2 Test applicability....3681
9.1.32.3 Minimum conformance requirements....3681
9.1.32.4 Test description....3681
9.1.32.4.1 Initial conditions....3681
9.1.32.4.2 Test procedure....3681
9.1.32.4.3 Message contents....3681
9.1.32.5 Test requirement....3683
9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal....3685
9.1.33.1 Test purpose....3685
9.1.33.2 Test applicability....3686
9.1.33.3 Minimum conformance requirements....3686
9.1.33.4 Test description....3688
9.1.33.4.1 Initial conditions....3688
9.1.33.4.2 Test procedure....3688
9.1.33.4.3 Message contents....3689
9.1.33.5 Test requirement....3689
9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal....3693
9.1.34.1 Test purpose....3693
9.1.34.2 Test applicability....3693
9.1.34.3 Minimum conformance requirements....3693
9.1.34.4 Test description....3693
9.1.34.4.1 Initial conditions....3693
9.1.34.4.2 Test procedure....3693
9.1.34.4.3 Message contents....3693
9.1.34.5 Test requirement....3694
9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal....3697
9.1.35.1 Test purpose....3697
9.1.35.2 Test applicability....3697
9.1.35.3 Minimum conformance requirements....3697
9.1.35.4 Test description....3699
9.1.35.4.1 Initial conditions....3699
9.1.35.4.2 Test procedure....3700
9.1.35.4.3 Message contents....3700
9.1.35.5 Test requirement....3702
9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal....3705
9.1.36.1 Test purpose....3705
9.1.36.2 Test applicability....3705
9.1.36.3 Minimum conformance requirements....3706
9.1.36.4 Test description....3706
9.1.36.4.1 Initial conditions....3706
9.1.36.4.2 Test procedure....3706
9.1.36.4.3 Message contents....3706
9.1.36.5 Test requirement....3708
9.1.37 to 9.1.40_1 Void....3711
9.1.41 FD-FDD Intra frequency RSRP Accuracy for UE category 0....3711
9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0....3711
9.1.41.1.1 Test purpose....3711
9.1.41.1.2 Test applicability....3711
9.1.41.1.3 Minimum conformance requirements....3711
9.1.41.1.4 Test description....3712
9.1.41.1.5 Test requirement....3713
9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0....3715
9.1.41.2.1 Test purpose....3715
9.1.41.2.2 Test applicability....3715
9.1.41.2.3 Minimum conformance requirements....3715

9.1.41.2.4 Test description 3716
9.1.41.2.5 Test requirement 3718
9.1.42 HD-FDD Intra frequency RSRP Accuracy for UE category 0 3720
9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0 3720
9.1.42.1.1 Test purpose 3720
9.1.42.1.2 Test applicability 3720
9.1.42.1.3 Minimum conformance requirements 3721
9.1.42.1.4 Test description 3722
9.1.42.1.5 Test requirement 3723
9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0 3725
9.1.42.2.1 Test purpose 3725
9.1.42.2.2 Test applicability 3725
9.1.42.2.3 Minimum conformance requirements 3726
9.1.42.2.4 Test description 3726
9.1.42.2.5 Test requirement 3728
9.1.43 TDD Intra frequency RSRP Accuracy for UE category 0 3730
9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0 3730
9.1.43.1.1 Test purpose 3730
9.1.43.1.2 Test applicability 3730
9.1.43.1.3 Minimum conformance requirements 3731
9.1.43.1.4 Test description 3732
9.1.43.1.5 Test requirement 3733
9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0 3735
9.1.43.2.1 Test purpose 3735
9.1.43.2.2 Test applicability 3735
9.1.43.2.3 Minimum conformance requirements 3735
9.1.43.2.4 Test description 3736
9.1.43.2.5 Test requirement 3738
9.1.44 to 9.1.51 Void 3740
9.1.52 FD-FDD RSRP Intra frequency case for BL/CE UE in CEModeA 3740
9.1.52.1 Test purpose 3740
9.1.52.2 Test applicability 3740
9.1.52.3 Minimum conformance requirements 3740
9.1.52.4 Test description 3742
9.1.52.4.1 Initial conditions 3742
9.1.52.4.2 Test procedure 3742
9.1.52.4.3 Message contents 3743
9.1.52.5 Test requirement 3743
9.1.53 HD-FDD RSRP Intra frequency case for BL/CE UE in CEModeA 3747
9.1.53.1 Test purpose 3747
9.1.53.2 Test applicability 3747
9.1.53.3 Minimum conformance requirements 3747
9.1.53.4 Test description 3747
9.1.53.5 Test requirement 3747
9.1.54 TDD RSRP Intra frequency case for BL/CE UE in CEModeA 3750
9.1.54.1 Test purpose 3750
9.1.54.2 Test applicability 3750
9.1.54.3 Minimum conformance requirements 3750
9.1.54.4 Test description 3750
9.1.54.5 Test requirement 3750
9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell 3752
9.1.55.1 Test purpose 3752
9.1.55.2 Test applicability 3752
9.1.55.3 Minimum conformance requirements 3752
9.1.55.4 Test description 3754
9.1.55.4.1 Initial conditions 3754
9.1.55.4.2 Test procedure 3755
9.1.55.4.3 Message contents 3755
9.1.55.5 Test requirement 3756
9.1.56 FS3 Intra frequency absolute and relative RSRP accuracies with TDD PCell 3759
9.1.56.1 Test purpose 3759
9.1.56.2 Test applicability 3759

9.1.56.3 Minimum conformance requirements 3760
9.1.56.4 Test description 3761
9.1.56.4.1 Initial conditions 3761
9.1.56.4.2 Test procedure 3762
9.1.56.4.3 Message contents 3762
9.1.56.5 Test requirement 3762
9.1.57 FD-FDD RSRP Intra frequency case for BL/CE UE in CEModeB 3765
9.1.57.1 Test purpose 3765
9.1.57.2 Test applicability 3765
9.1.57.3 Minimum conformance requirements 3765
9.1.57.4 Test description 3767
9.1.57.4.1 Initial conditions 3767
9.1.57.4.2 Test procedure 3768
9.1.57.4.3 Message contents 3768
9.1.57.5 Test requirement 3769
9.1.58 HD-FDD RSRP Intra frequency case for BL/CE UE in CEModeB 3772
9.1.58.1 Test purpose 3772
9.1.58.2 Test applicability 3772
9.1.58.3 Minimum conformance requirements 3772
9.1.58.4 Test description 3773
9.1.58.5 Test requirement 3773
9.1.59 TDD RSRP Intra frequency case for BL/CE UE in CEModeB 3776
9.1.59.1 Test purpose 3776
9.1.59.2 Test applicability 3776
9.1.59.3 Minimum conformance requirements 3776
9.1.59.4 Test description 3776
9.1.59.4.1 Initial conditions 3776
9.1.59.4.2 Test procedure 3776
9.1.59.4.3 Message contents 3776
9.1.59.5 Test requirement 3776
9.1.60 FS3 Absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal with FDD PCell 3778
9.1.60.1 Test purpose 3778
9.1.60.2 Test applicability 3779
9.1.60.3 Minimum conformance requirements 3779
9.1.60.4 Test description 3780
9.1.60.4.1 Initial conditions 3780
9.1.60.4.2 Test procedure 3781
9.1.60.4.3 Message contents 3781
9.1.60.5 Test requirement 3783
9.1.61 FS3 Absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal with TDD PCell 3786
9.1.61.1 Test purpose 3786
9.1.61.2 Test applicability 3787
9.1.61.3 Minimum conformance requirements 3787
9.1.61.4 Test description 3788
9.1.61.4.1 Initial conditions 3788
9.1.61.4.2 Test procedure 3789
9.1.61.4.3 Message contents 3789
9.1.61.5 Test requirement 3789
9.1.62 to 9.1.67 3792
9.1.68 3DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes 3792
9.1.68.1 Test purpose 3792
9.1.68.2 Test applicability 3792
9.1.68.3 Minimum conformance requirements 3793
9.1.68.4 Test description 3795
9.1.68.4.1 Initial conditions 3795
9.1.68.4.2 Test procedure 3795
9.1.68.4.3 Message contents 3796
9.1.68.5 Test requirement 3797
9.1.69 4 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes 3801
9.1.69.1 Test purpose 3801
9.1.69.2 Test applicability 3801
9.1.69.3 Minimum conformance requirements 3801

9.1.69.4 Test description 3803
9.1.69.4.1 Initial conditions 3803
9.1.69.4.2 Test procedure 3804
9.1.69.4.3 Message contents 3805
9.1.69.5 Test requirement 3805
9.1.70 5 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes 3813
9.1.70.1 Test purpose 3813
9.1.70.2 Test applicability 3813
9.1.70.3 Minimum conformance requirements 3813
9.1.70.4 Test description 3816
9.1.70.4.1 Initial conditions 3816
9.1.70.4.2 Test procedure 3816
9.1.70.4.3 Message contents 3817
9.1.70.5 Test requirement 3818
9.1.71 6 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes 3828
9.1.71.1 Test purpose 3828
9.1.71.2 Test applicability 3828
9.1.71.3 Minimum conformance requirements 3829
9.1.71.4 Test description 3831
9.1.71.4.1 Initial conditions 3831
9.1.71.4.2 Test procedure 3831
9.1.71.4.3 Message contents 3833
9.1.71.5 Test requirement 3833
9.1.72 7 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes 3845
9.2 RSRQ 3864
9.2.1 FDD Intra frequency RSRQ Accuracy 3864
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy 3864
9.2.1.1.1 Test purpose 3864
9.2.1.1.2 Test applicability 3865
9.2.1.1.3 Minimum conformance requirements 3865
9.2.1.1.4 Test description 3865
9.2.1.1.4.1 Initial conditions 3865
9.2.1.1.4.2 Test procedure 3866
9.2.1.1.5 Test requirement 3867
9.2.1.1_2 FDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis 3869
9.2.1.1_2.1 Test purpose 3869
9.2.1.1_2.2 Test applicability 3869
9.2.1.1_2.3 Minimum conformance requirements 3869
9.2.1.1_2.4 Test description 3870
9.2.1.1_2.5 Test requirement 3871
9.2.2 TDD Intra frequency RSRQ Accuracy 3872
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy 3872
9.2.2.1.1 Test purpose 3872
9.2.2.1.2 Test applicability 3872
9.2.2.1.3 Minimum conformance requirements 3872
9.2.2.1.4 Test description 3873
9.2.2.1.4.1 Initial conditions 3873
9.2.2.1.4.2 Test procedure 3874
9.2.2.1.4.3 Message contents 3874
9.2.2.1.5 Test requirement 3875
9.2.2.1_2 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis 3877
9.2.2.1_2.1 Test purpose 3877
9.2.2.1_2.2 Test applicability 3877
9.2.2.1_2.3 Minimum conformance requirements 3877
9.2.2.1_2.4 Test description 3877
9.2.2.1_2.4.1 Initial conditions 3877
9.2.2.1_2.4.2 Test procedure 3877
9.2.2.1_2.4.3 Message contents 3878
9.2.2.1_2.5 Test requirement 3878
9.2.3 FDD - FDD Inter frequency RSRQ Accuracy 3880
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy 3880
9.2.3.1.1 Test purpose 3880

9.2.3.1.2 Test applicability 3880
9.2.3.1.3 Minimum conformance requirements 3880
9.2.3.1.4 Test description 3881
9.2.3.1.4.1 Initial conditions 3881
9.2.3.1.4.2 Test procedure 3882
9.2.3.1.4.3 Message contents 3882
9.2.3.1.5 Test requirement 3883
9.2.3.1_2 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis 3885
9.2.3.1_2.1 Test purpose 3885
9.2.3.1_2.2 Test applicability 3885
9.2.3.1_2.3 Minimum conformance requirements 3885
9.2.3.1_2.4 Test description 3886
9.2.3.1_2.4.1 Initial conditions 3886
9.2.3.1_2.4.2 Test procedure 3887
9.2.3.1_2.4.3 Message contents 3887
9.2.3.1_2.5 Test requirement 3887
9.2.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ 3889
9.2.3.2.1 Test purpose 3889
9.2.3.2.2 Test applicability 3889
9.2.3.2.3 Minimum conformance requirements 3889
9.2.3.2.4 Test description 3890
9.2.3.2.4.1 Initial conditions 3890
9.2.3.2.4.2 Test procedure 3891
9.2.3.2.4.3 Message contents 3891
9.2.3.2.5 Test requirement 3892
9.2.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis 3894
9.2.3.2_2.1 Test purpose 3894
9.2.3.2_2.2 Test applicability 3894
9.2.3.2_2.3 Minimum conformance requirements 3894
9.2.3.2_2.4 Test description 3895
9.2.3.2_2.4.1 Initial conditions 3895
9.2.3.2_2.4.2 Test procedure 3896
9.2.3.2_2.4.3 Message contents 3896
9.2.3.2_2.5 Test requirement 3896
9.2.4 TDD - TDD Inter frequency RSRQ Accuracy 3898
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy 3898
9.2.4.1.1 Test purpose 3898
9.2.4.1.2 Test applicability 3898
9.2.4.1.3 Minimum conformance requirements 3898
9.2.4.1.4 Test description 3899
9.2.4.1.4.1 Initial conditions 3899
9.2.4.1.4.2 Test procedure 3899
9.2.4.1.4.3 Message contents 3900
9.2.4.1.5 Test requirement 3900
9.2.4.1_1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy (Rel-12 and forward) 3903
9.2.4.1_1.1 Test purpose 3903
9.2.4.1_1.2 Test applicability 3903
9.2.4.1_1.3 Minimum conformance requirements 3903
9.2.4.1_1.4 Test description 3903
9.2.4.1_1.4.1 Initial conditions 3903
9.2.4.1_1.4.2 Test procedure 3903
9.2.4.1_1.4.3 Message contents 3904
9.2.4.1_1.5 Test requirement 3904
9.2.4.1_2 TDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis 3907
9.2.4.1_2.1 Test purpose 3907
9.2.4.1_2.2 Test applicability 3907
9.2.4.1_2.3 Minimum conformance requirements 3907
9.2.4.1_2.4 Test description 3908
9.2.4.1_2.4.1 Initial conditions 3908
9.2.4.1_2.4.2 Test procedure 3908
9.2.4.1_2.4.3 Message contents 3908
9.2.4.1_2.5 Test requirement 3908

9.2.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ....3910
9.2.4.2.1 Test purpose....3910
9.2.4.2.2 Test applicability....3910
9.2.4.2.3 Minimum conformance requirements....3910
9.2.4.2.4 Test description....3911
9.2.4.2.4.1 Initial conditions....3911
9.2.4.2.4.2 Test procedure....3911
9.2.4.2.4.3 Message contents....3912
9.2.4.2.5 Test requirement....3912
9.2.4.2_1 TDD - TDD Inter Frequency Relative Accuracy of RSRQ (Rel-12 and forward)....3915
9.2.4.2_1.1 Test purpose....3915
9.2.4.2_1.2 Test applicability....3915
9.2.4.2_1.3 Minimum conformance requirements....3915
9.2.4.2_1.4 Test description....3915
9.2.4.2_1.4.1 Initial conditions....3915
9.2.4.2_1.4.2 Test procedure....3915
9.2.4.2_1.4.3 Message contents....3916
9.2.4.2_1.5 Test requirement....3916
9.2.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis....3919
9.2.4.2_1.1 Test purpose....3919
9.2.4.2_2.2 Test applicability....3919
9.2.4.2_2.3 Minimum conformance requirements....3919
9.2.4.2_2.4 Test description....3920
9.2.4.2_2.4.1 Initial conditions....3920
9.2.4.2_2.4.2 Test procedure....3920
9.2.4.2_2.4.3 Message contents....3921
9.2.4.2_2.5 Test requirement....3922
9.2.4A FDD - TDD Inter frequency RSRQ Accuracy....3924
9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy....3924
9.2.4A.1.1 Test purpose....3924
9.2.4A.1.2 Test applicability....3924
9.2.4A.1.3 Minimum conformance requirements....3924
9.2.4A.1.4 Test description....3925
9.2.4A.1.4.1 Initial conditions....3925
9.2.4A.1.4.2 Test procedure....3926
9.2.4A.1.4.3 Message contents....3926
9.2.4A.1.5 Test requirement....3927
9.2.4A.1_2 FDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis....3930
9.2.4A.1_2.1 Test purpose....3930
9.2.4A.1_2.2 Test applicability....3930
9.2.4A.1_2.3 Minimum conformance requirements....3930
9.2.4A.1_2.4 Test description....3931
9.2.4A.1_2.4.1 Initial conditions....3931
9.2.4A.1_2.4.2 Test procedure....3931
9.2.4A.1_2.4.3 Message contents....3931
9.2.4A.1_2.5 Test requirement....3932
9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ....3935
9.2.4A.2.1 Test purpose....3935
9.2.4A.2.2 Test applicability....3935
9.2.4A.2.3 Minimum conformance requirements....3935
9.2.4A.2.4 Test description....3936
9.2.4A.2.4.1 Initial conditions....3936
9.2.4A.2.4.2 Test procedure....3936
9.2.4A.2.4.3 Message contents....3936
9.2.4A.2.5 Test requirement....3937
9.2.4A.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis....3940
9.2.4A.2_2.1 Test purpose....3940
9.2.4A.2_2.2 Test applicability....3940
9.2.4A.2_2.3 Minimum conformance requirements....3940
9.2.4A.2_2.4 Test description....3941
9.2.4A.2_2.4.1 Initial conditions....3941
9.2.4A.2_2.4.2 Test procedure....3941

9.2.4A.2_2.4.3 Message contents 3941
9.2.4A.2_2.5 Test requirement 3942
9.2.5 FDD RSRQ for E-UTRA Carrier Aggregation 3945
9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation 3945
9.2.5.1.1 Test purpose 3945
9.2.5.1.2 Test applicability 3945
9.2.5.1.3 Minimum conformance requirements 3945
9.2.5.1.4 Test description 3946
9.2.5.1.4.1 Initial conditions 3946
9.2.5.1.4.2 Test procedure 3946
9.2.5.1.4.3 Message contents 3947
9.2.5.1.5 Test requirement 3947
9.2.5.2 FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation 3950
9.2.5.2.1 Test purpose 3950
9.2.5.2.2 Test applicability 3950
9.2.5.2.3 Minimum conformance requirements 3950
9.2.5.2.4 Test description 3951
9.2.5.2.4.1 Initial conditions 3951
9.2.5.2.4.2 Test procedure 3952
9.2.5.2.4.3 Message contents 3952
9.2.5.2.5 Test requirement 3952
9.2.6 TDD RSRQ for E-UTRA Carrier Aggregation 3955
9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation 3955
9.2.6.1.1 Test purpose 3955
9.2.6.1.2 Test applicability 3955
9.2.6.1.3 Minimum conformance requirements 3955
9.2.6.1.4 Test description 3956
9.2.6.1.4.1 Initial conditions 3956
9.2.6.1.4.2 Test procedure 3957
9.2.6.1.4.3 Message contents 3957
9.2.6.1.5 Test requirement 3957
9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation 3959
9.2.6.2.1 Test purpose 3959
9.2.6.2.2 Test applicability 3959
9.2.6.2.3 Minimum conformance requirements 3959
9.2.6.2.4 Test description 3960
9.2.6.2.4.1 Initial conditions 3960
9.2.6.2.4.2 Test procedure 3961
9.2.6.2.4.3 Message contents 3961
9.2.6.2.5 Test requirement 3962
9.2.7 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS 3964
9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) 3964
9.2.7.1.1 Test purpose 3964
9.2.7.1.2 Test applicability 3964
9.2.7.1.3 Minimum conformance requirements 3964
9.2.7.1.4 Test description 3965
9.2.7.1.4.1 Initial conditions 3965
9.2.7.1.4.2 Test procedure 3966
9.2.7.1.5 Test requirement 3968
9.2.8 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS 3970
9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) 3970
9.2.8.1.1 Test purpose 3970
9.2.8.1.2 Test applicability 3970
9.2.8.1.3 Minimum conformance requirements 3970
9.2.8.1.4 Test description 3972
9.2.8.1.4.1 Initial conditions 3972
9.2.8.1.4.2 Test procedure 3972
9.2.8.1.5 Test requirement 3974

9.2.9 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS....3977
9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3977
9.2.9.1.1 Test purpose 3977
9.2.9.1.2 Test applicability 3977
9.2.9.1.3 Minimum conformance requirements....3977
9.2.9.1.4 Test description 3978
9.2.9.1.4.1 Initial conditions 3978
9.2.9.1.4.2 Test procedure....3979
9.2.9.1.5 Test requirement....3982
9.2.10 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS ...3984
9.2.10.1 TDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) 3984
9.2.10.1.1 Test purpose 3984
9.2.10.1.2 Test applicability 3985
9.2.10.1.3 Minimum conformance requirements....3985
9.2.10.1.4 Test description 3986
9.2.10.1.4.1 Initial conditions 3986
9.2.10.1.4.2 Test procedure....3987
9.2.10.1.5 Test requirement....3990
9.2.11 FDD RSRQ for E-UTRA Carrier Aggregation for 20MHz....3992
9.2.11.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz....3992
9.2.11.1.1 Test purpose 3992
9.2.11.1.2 Test applicability 3992
9.2.11.1.3 Minimum conformance requirements....3992
9.2.11.1.4 Test description 3993
9.2.11.1.4.1 Initial conditions 3993
9.2.11.1.4.2 Test procedure....3994
9.2.11.1.4.3 Message contents 3994
9.2.11.1.5 Test requirement....3995
9.2.11.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz....3996
9.2.11.2.1 Test purpose 3996
9.2.11.2.2 Test applicability 3996
9.2.11.2.3 Minimum conformance requirements....3996
9.2.11.2.4 Test description 3997
9.2.11.2.4.1 Initial conditions 3997
9.2.11.2.4.2 Test procedure....3998
9.2.11.2.4.3 Message contents 3998
9.2.11.2.5 Test requirement....3998
9.2.12 TDD RSRQ for E-UTRA Carrier Aggregation for 20MHz....4000
9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz 4000
9.2.12.1.1 Test purpose 4000
9.2.12.1.2 Test applicability 4000
9.2.12.1.3 Minimum conformance requirements....4000
9.2.12.1.4 Test description 4001
9.2.12.1.4.1 Initial conditions 4001
9.2.12.1.4.2 Test procedure....4001
9.2.12.1.4.3 Message contents 4002
9.2.12.1.5 Test requirement....4002
9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz....4003
9.2.12.2.1 Test purpose 4003
9.2.12.2.2 Test applicability 4004
9.2.12.2.3 Minimum conformance requirements....4004
9.2.12.2.4 Test description 4005
9.2.12.2.4.1 Initial conditions 4005
9.2.12.2.4.2 Test procedure....4005
9.2.12.2.4.3 Message contents 4006
9.2.12.2.5 Test requirement....4006
9.2.13 Void 4007
9.2.14 Void 4007
9.2.15 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS 4007

9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 4007
9.2.15.1.1 Test purpose 4007
9.2.15.1.2 Test applicability 4007
9.2.15.1.3 Minimum conformance requirements 4007
9.2.15.1.4 Test description 4008
9.2.15.1.4.1 Initial conditions 4008
9.2.15.1.4.2 Test procedure 4009
9.2.15.1.5 Test requirement 4011
9.2.16 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS 4014
9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) 4014
9.2.16.1.1 Test purpose 4014
9.2.16.1.2 Test applicability 4014
9.2.16.1.3 Minimum conformance requirements 4014
9.2.16.1.4 Test description 4015
9.2.16.1.4.1 Initial conditions 4015
9.2.16.1.4.2 Test procedure 4016
9.2.16.1.5 Test requirement 4018
9.2.17 FDD Intra frequency RSRQ Accuracy for 5MHz Bandwidth 4020
9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth 4020
9.2.17.1.1 Test purpose 4020
9.2.17.1.2 Test applicability 4020
9.2.17.1.3 Minimum conformance requirements 4020
9.2.17.1.4 Test description 4021
9.2.17.1.4.1 Initial conditions 4021
9.2.17.1.4.2 Test procedure 4021
9.2.17.1.5 Test requirement 4021
9.2.18 FDD - FDD Inter frequency RSRQ Accuracy for 5MHz Bandwidth 4023
9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth 4023
9.2.18.1.1 Test purpose 4023
9.2.18.1.2 Test applicability 4023
9.2.18.1.3 Minimum conformance requirements 4023
9.2.18.1.4 Test description 4024
9.2.18.1.4.1 Initial conditions 4024
9.2.18.1.4.2 Test procedure 4024
9.2.18.1.4.3 Message contents 4024
9.2.18.1.5 Test requirement 4024
9.2.18.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ for 5MHz Bandwidth 4027
9.2.18.2.1 Test purpose 4027
9.2.18.2.2 Test applicability 4027
9.2.18.2.3 Minimum conformance requirements 4027
9.2.18.2.4 Test description 4028
9.2.18.2.4.1 Initial conditions 4028
9.2.18.2.4.2 Test procedure 4028
9.2.18.2.4.3 Message contents 4028
9.2.18.2.5 Test requirement 4028
9.2.19 FDD-FDD Inter Frequency WB-RSRQ 4031
9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy 4031
9.2.19.1.1 Test purpose 4031
9.2.19.1.2 Test applicability 4031
9.2.19.1.3 Minimum conformance requirements 4031
9.2.19.1.4 Test description 4032
9.2.19.1.4.1 Initial conditions 4032
9.2.19.1.4.2 Test procedure 4033
9.2.19.1.4.3 Message contents 4033
9.2.19.1.5 Test requirement 4033
9.2.20 TDD-TDD Inter Frequency WB-RSRQ 4035
9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy 4035
9.2.20.1.1 Test purpose 4035
9.2.20.1.2 Test applicability 4035

9.2.20.1.3 Minimum conformance requirements....4035
9.2.20.1.4 Test description....4036
9.2.20.1.4.1 Initial conditions....4036
9.2.20.1.4.2 Test procedure....4037
9.2.20.1.4.3 Message contents....4037
9.2.20.1.5 Test requirement....4037
9.2.21 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4039
9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4039
9.2.21.1.1 Test purpose....4039
9.2.21.1.2 Test applicability....4039
9.2.21.1.3 Minimum conformance requirements....4039
9.2.21.1.4 Test description....4039
9.2.21.1.4.1 Initial conditions....4039
9.2.21.1.4.2 Test procedure....4040
9.2.21.1.4.3 Message contents....4040
9.2.21.1.5 Test requirement....4040
9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4042
9.2.21.2.1 Test purpose....4042
9.2.21.2.2 Test applicability....4042
9.2.21.2.3 Minimum conformance requirements....4042
9.2.21.2.4 Test description....4042
9.2.21.2.4.1 Initial conditions....4042
9.2.21.2.4.3 Message contents....4043
9.2.21.2.5 Test requirement....4043
9.2.22 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4045
9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4045
9.2.22.1.1 Test purpose....4045
9.2.22.1.2 Test applicability....4045
9.2.22.1.3 Minimum conformance requirements....4045
9.2.22.1.4 Test description....4045
9.2.22.1.4.1 Initial conditions....4045
9.2.22.1.4.2 Test procedure....4045
9.2.22.1.4.3 Message contents....4046
9.2.22.1.5 Test requirement....4046
9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz....4047
9.2.22.2.1 Test purpose....4047
9.2.22.2.2 Test applicability....4047
9.2.22.2.3 Minimum conformance requirements....4047
9.2.22.2.4 Test description....4047
9.2.22.2.4.1 Initial conditions....4047
9.2.22.2.4.2 Test procedure....4048
9.2.22.2.4.3 Message contents....4048
9.2.22.2.5 Test requirement....4048
9.2.23 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz....4050
9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz....4050
9.2.23.1.1 Test purpose....4050
9.2.23.1.2 Test applicability....4050
9.2.23.1.3 Minimum conformance requirements....4050
9.2.23.1.4 Test description....4050
9.2.23.1.4.1 Initial conditions....4050
9.2.23.1.4.2 Test procedure....4050
9.2.23.1.4.3 Message contents....4051
9.2.23.1.5 Test requirement....4051
9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz....4053
9.2.23.2.1 Test purpose....4053
9.2.23.2.2 Test applicability....4053
9.2.23.2.3 Minimum conformance requirements....4053
9.2.23.2.4 Test description....4053
9.2.23.2.4.1 Initial conditions....4053
9.2.23.2.4.2 Test procedure....4054
9.2.23.2.4.3 Message contents....4054
9.2.23.2.5 Test requirement....4054

9.2.24 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz 4056
9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz 4056
9.2.24.1.1 Test purpose 4056
9.2.24.1.2 Test applicability 4056
9.2.24.1.3 Minimum conformance requirements 4056
9.2.24.1.4 Test description 4056
9.2.24.1.4.1 Initial conditions 4056
9.2.24.1.4.2 Test procedure 4056
9.2.24.1.4.3 Message contents 4057
9.2.24.1.5 Test requirement 4057
9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz 4058
9.2.24.2.1 Test purpose 4058
9.2.24.2.2 Test applicability 4058
9.2.24.2.3 Minimum conformance requirements 4058
9.2.24.2.4 Test description 4058
9.2.24.2.4.1 Initial conditions 4058
9.2.24.2.4.2 Test procedure 4059
9.2.24.2.4.3 Message contents 4059
9.2.24.2.5 Test requirement 4059
9.2.25 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD 4061
9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD 4061
9.2.25.1.1 Test purpose 4061
9.2.25.1.2 Test applicability 4061
9.2.25.1.3 Minimum conformance requirements 4061
9.2.25.1.4 Test description 4062
9.2.25.1.4.1 Initial conditions 4062
9.2.25.1.4.2 Test procedure 4062
9.2.25.1.4.3 Message contents 4063
9.2.25.1.5 Test requirement 4065
9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD 4068
9.2.25.2.1 Test purpose 4068
9.2.25.2.2 Test applicability 4068
9.2.25.2.3 Minimum conformance requirements 4068
9.2.25.2.4 Test description 4069
9.2.25.2.4.1 Initial conditions 4069
9.2.25.2.4.2 Test procedure 4070
9.2.25.2.4.3 Message contents 4070
9.2.25.2.5 Test requirement 4072
9.2.26 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD 4075
9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD 4075
9.2.26.1.1 Test purpose 4075
9.2.26.1.2 Test applicability 4075
9.2.26.1.3 Minimum conformance requirements 4075
9.2.26.1.4 Test description 4076
9.2.26.1.4.1 Initial conditions 4076
9.2.26.1.4.2 Test procedure 4077
9.2.26.1.4.3 Message contents 4077
9.2.26.1.5 Test requirement 4079
9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD 4082
9.2.26.2.1 Test purpose 4082
9.2.26.2.2 Test applicability 4082
9.2.26.2.3 Minimum conformance requirements 4082
9.2.26.2.4 Test description 4083
9.2.26.2.4.1 Initial conditions 4083
9.2.26.2.4.2 Test procedure 4084
9.2.26.2.4.3 Message contents 4084
9.2.26.2.5 Test requirement 4086
9.2.27 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz 4089
9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz 4089
9.2.27.1.1 Test purpose 4089
9.2.27.1.2 Test applicability 4089
9.2.27.1.3 Minimum conformance requirements 4089

9.2.27.1.4 Test description 4089
9.2.27.1.4.1 Initial conditions 4089
9.2.27.1.4.2 Test procedure 4090
9.2.27.1.4.3 Message contents 4090
9.2.27.1.5 Test requirement 4090
9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz 4091
9.2.27.2.1 Test purpose 4091
9.2.27.2.2 Test applicability 4091
9.2.27.2.3 Minimum conformance requirements 4091
9.2.27.2.4 Test description 4092
9.2.27.2.4.1 Initial conditions 4092
9.2.27.2.4.2 Test procedure 4092
9.2.27.2.4.3 Message contents 4092
9.2.27.2.5 Test requirement 4092
9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal 4094
9.2.28.1 Test purpose 4094
9.2.28.2 Test applicability 4094
9.2.28.3 Minimum conformance requirements 4094
9.2.28.4 Test description 4095
9.2.28.4.1 Initial conditions 4095
9.2.28.4.2 Test procedure 4095
9.2.28.4.3 Message contents 4096
9.2.28.5 Test requirement 4097
9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal 4099
9.2.29.1 Test purpose 4099
9.2.29.2 Test applicability 4099
9.2.29.3 Minimum conformance requirements 4099
9.2.29.4 Test description 4099
9.2.29.4.1 Initial conditions 4099
9.2.29.4.2 Test procedure 4099
9.2.29.4.3 Message contents 4100
9.2.29.5 Test requirement 4101
9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal 4103
9.2.30.1 Test purpose 4103
9.2.30.2 Test applicability 4103
9.2.30.3 Minimum conformance requirements 4103
9.2.30.4 Test description 4105
9.2.30.4.1 Initial conditions 4105
9.2.30.4.2 Test procedure 4105
9.2.30.4.3 Message contents 4106
9.2.30.5 Test requirement 4107
9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal 4109
9.2.31.1 Test purpose 4109
9.2.31.2 Test applicability 4109
9.2.31.3 Minimum conformance requirements 4110
9.2.31.4 Test description 4110
9.2.31.4.1 Initial conditions 4110
9.2.31.4.2 Test procedure 4110
9.2.31.4.3 Message contents 4110
9.2.31.5 Test requirement 4111
9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal 4113
9.2.32.1 Test purpose 4113
9.2.32.2 Test applicability 4113
9.2.32.3 Minimum conformance requirements 4113
9.2.32.4 Test description 4115
9.2.32.4.1 Initial conditions 4115
9.2.32.4.2 Test procedure 4116
9.2.32.4.3 Message contents 4116
9.2.32.5 Test requirement 4117
9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal 4119

9.2.33.1 Test purpose 4119
9.2.33.2 Test applicability 4120
9.2.33.3 Minimum conformance requirements 4120
9.2.33.4 Test description 4120
9.2.33.4.1 Initial conditions 4120
9.2.33.4.2 Test procedure 4120
9.2.33.4.3 Message contents 4120
9.2.33.5 Test requirement 4121
9.2.34 to 9.2.37 4123
9.2.38 to 9.2.41 Void 4123
9.2.42 FD-FDD RSRQ Intra frequency case for UE category 0 4123
9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0 4123
9.2.42.1.1 Test purpose 4123
9.2.42.1.2 Test applicability 4124
9.2.42.1.3 Minimum conformance requirements 4124
9.2.42.1.4 Test description 4124
9.2.42.1.4.1 Initial conditions 4124
9.2.42.1.4.2 Test procedure 4125
9.2.42.1.4.3 Message contents 4125
9.2.42.1.5 Test requirement 4126
9.2.43 HD-FDD RSRQ Intra frequency case for UE category 0 4128
9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0 4128
9.2.43.1.1 Test purpose 4128
9.2.43.1.2 Test applicability 4128
9.2.43.1.3 Minimum conformance requirements 4128
9.2.43.1.4 Test description 4129
9.2.43.1.4.1 Initial conditions 4129
9.2.43.1.4.2 Test procedure 4129
9.2.43.1.4.3 Message contents 4130
9.2.43.1.5 Test requirement 4130
9.2.44 TDD RSRQ Intra frequency case for UE category 0 4133
9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0 4133
9.2.44.1.1 Test purpose 4133
9.2.44.1.2 Test applicability 4133
9.2.44.1.3 Minimum conformance requirements 4133
9.2.44.1.4 Test description 4134
9.2.44.1.4.1 Initial conditions 4134
9.2.44.1.4.2 Test procedure 4134
9.2.44.1.4.3 Message contents 4135
9.2.44.1.5 Test requirement 4136
9.2.45 to 9.2.50 Void 4137
9.2.51 FS3 Intra frequency absolute and relative RSRQ accuracies with FDD PCell 4137
9.2.51.1 Test purpose 4137
9.2.51.2 Test applicability 4137
9.2.51.3 Minimum conformance requirements 4137
9.2.51.4 Test description 4139
9.2.51.4.1 Initial conditions 4139
9.2.51.4.2 Test procedure 4139
9.2.51.4.3 Message contents 4140
9.2.51.5 Test requirement 4141
9.2.52 FS3 Intra frequency absolute and relative RSRQ accuracies with TDD PCell 4144
9.2.52.1 Test purpose 4144
9.2.52.2 Test applicability 4145
9.2.52.3 Minimum conformance requirements 4145
9.2.52.4 Test description 4146
9.2.52.4.1 Initial conditions 4146
9.2.52.4.2 Test procedure 4147
9.2.52.4.3 Message contents 4147
9.2.52.5 Test requirement 4148
9.2.53 to 9.2.54 Void 4151
9.2.55 3DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes 4151
9.2.55.1 Test purpose 4151

9.2.55.2 Test applicability 4151
9.2.55.3 Minimum conformance requirements 4151
9.2.55.4 Test description 4153
9.2.55.4.1 Initial conditions 4153
9.2.55.4.2 Test procedure 4154
9.2.55.4.3 Message contents 4154
9.2.55.5 Test requirement 4155
9.2.56 4 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes 4159
9.2.56.1 Test purpose 4159
9.2.56.2 Test applicability 4159
9.2.56.3 Minimum conformance requirements 4159
9.2.56.4 Test description 4161
9.2.56.4.1 Initial conditions 4161
9.2.56.4.2 Test procedure 4161
9.2.56.4.3 Message contents 4162
9.2.56.5 Test requirement 4162
9.2.57 5 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes 4166
9.2.57.1 Test purpose 4166
9.2.57.2 Test applicability 4167
9.2.57.3 Minimum conformance requirements 4167
9.2.57.4 Test description 4168
9.2.57.4.1 Initial conditions 4168
9.2.57.4.2 Test procedure 4169
9.2.57.4.3 Message contents 4169
9.2.57.5 Test requirement 4170
9.2.58 6 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes 4174
9.2.58.1 Test purpose 4174
9.2.58.2 Test applicability 4174
9.2.58.3 Minimum conformance requirements 4174
9.2.58.4 Test description 4176
9.2.58.4.1 Initial conditions 4176
9.2.58.4.2 Test procedure 4177
9.2.58.4.3 Message contents 4177
9.2.58.5 Test requirement 4178
9.2.59 7 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes 4183
9.3 UTRA FDD CPICH RSCP 4192
9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy 4192
9.3.1.1 Test purpose 4192
9.3.1.2 Test applicability 4192
9.3.1.3 Minimum conformance requirements 4192
9.3.1.4 Test description 4193
9.3.1.4.1 Initial conditions 4193
9.3.1.4.2 Test procedure 4194
9.3.1.4.3 Message contents 4194
9.3.1.5 Test requirement 4196
9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy 4199
9.3.2.1 Test purpose 4199
9.3.2.2 Test applicability 4199
9.3.2.3 Minimum conformance requirements 4199
9.3.2.4 Test description 4200
9.3.2.4.1 Initial conditions 4200
9.3.2.4.2 Test procedure 4201
9.3.2.4.3 Message contents 4201
9.3.2.5 Test requirement 4203
9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth 4206
9.3.3.1 Test purpose 4206
9.3.3.2 Test applicability 4206
9.3.3.3 Minimum conformance requirements 4206
9.3.3.4 Test description 4207
9.3.3.4.1 Initial conditions 4207
9.3.3.4.2 Test procedure 4207
9.3.3.4.3 Message contents 4207

9.3.3.5 Test requirement 4208
9.4 UTRAN FDD CPICH Ec/No 4208
9.4.1 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy 4208
9.4.1.1 Test purpose 4208
9.4.1.2 Test applicability 4208
9.4.1.3 Minimum conformance requirements 4209
9.4.1.4 Test description 4210
9.4.1.4.1 Initial conditions 4210
9.4.1.4.2 Test procedure 4210
9.4.1.4.3 Message contents 4210
9.4.1.5 Test requirement 4212
9.4.2 E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy 4214
9.4.2.1 Test purpose 4214
9.4.2.2 Test applicability 4214
9.4.2.3 Minimum conformance requirements 4215
9.4.2.4 Test description 4216
9.4.2.4.1 Initial conditions 4216
9.4.2.4.2 Test procedure 4216
9.4.2.4.3 Message contents 4217
9.4.2.5 Test requirement 4219
9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth 4221
9.4.3.1 Test purpose 4221
9.4.3.2 Test applicability 4221
9.4.3.3 Minimum conformance requirements 4222
9.4.3.4 Test description 4222
9.4.3.4.1 Initial conditions 4222
9.4.3.4.2 Test procedure 4223
9.4.3.4.3 Message contents 4223
9.4.3.5 Test requirement 4223
9.5 UTRAN TDD P-CCPCH RSCP 4224
9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy 4224
9.5.1.1 Test purpose 4224
9.5.1.2 Test applicability 4224
9.5.1.3 Minimum conformance requirements 4224
9.5.1.4 Test description 4225
9.5.1.4.1 Initial conditions 4225
9.5.1.4.2 Test procedure 4225
9.5.1.4.3 Message contents 4226
9.5.1.5 Test requirement 4228
9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy 4230
9.5.2.1 Test purpose 4230
9.5.2.2 Test applicability 4230
9.5.2.3 Minimum conformance requirements 4230
9.5.2.4 Test description 4231
9.5.2.4.1 Initial conditions 4231
9.5.2.4.2 Test procedure 4232
9.5.2.4.3 Message contents 4232
9.5.2.5 Test requirement 4234
9.6 GSM carrier RSSI 4236
9.6.1 GSM RSSI accuracy for E-UTRAN FDD 4236
9.6.1.1 Test purpose 4236
9.6.1.2 Test applicability 4236
9.6.1.3 Minimum conformance requirements 4236
9.6.1.4 Test description 4238
9.6.1.4.1 Initial conditions 4238
9.6.1.4.2 Test procedure 4238
9.6.1.4.3 Message contents 4239
9.6.1.5 Test requirement 4240
9.6.2 GSM RSSI accuracy for E-UTRAN TDD 4242
9.6.2.1 Test purpose 4242
9.6.2.2 Test applicability 4242
9.6.2.3 Minimum conformance requirements 4243

9.6.2.4 Test description 4244
9.6.2.4.1 Initial conditions 4244
9.6.2.4.2 Test procedure 4245
9.6.2.4.3 Message contents 4245
9.6.2.5 Test requirement 4246
9.7 UE Rx – Tx Time Difference 4249
9.8 RSTD 4249
9.9 Serving Cell RSRP and RSRQ 4249
9.9.1 FDD Serving Cell RSRP and RSRQ Accuracy 4249
9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy 4249
9.9.1.1.1 Test purpose 4249
9.9.1.1.2 Test applicability 4249
9.9.1.1.3 Minimum conformance requirements 4249
9.9.1.1.4 Test description 4250
9.9.1.1.4.1 Initial conditions 4250
9.9.1.1.4.2 Test procedure 4250
9.9.1.1.5 Test requirement 4251
9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward) 4254
9.9.1.1_1.1 Test purpose 4254
9.9.1.1_1.2 Test applicability 4254
9.9.1.1_1.3 Minimum conformance requirements 4254
9.9.1.1_1.4 Test description 4255
9.9.1.1_1.4.1 Initial conditions 4255
9.9.1.1_1.4.2 Test procedure 4255
9.9.1.1_1.5 Test requirement 4255
9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy 4258
9.9.1.2.1 Test purpose 4258
9.9.1.2.2 Test applicability 4258
9.9.1.2.3 Minimum conformance requirements 4258
9.9.1.2.4 Test description 4259
9.9.1.2.4.1 Initial conditions 4259
9.9.1.2.4.2 Test procedure 4259
9.9.1.2.4.3 Message contents 4259
9.9.1.2.5 Test requirement 4260
9.9.2 TDD Serving Cell RSRP and RSRQ Accuracy 4262
9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy 4262
9.9.2.1.1 Test purpose 4262
9.9.2.1.2 Test applicability 4262
9.9.2.1.3 Minimum conformance requirements 4262
9.9.2.1.4 Test description 4263
9.9.2.1.4.1 Initial conditions 4263
9.9.2.1.4.2 Test procedure 4264
9.9.2.1.5 Test requirement 4264
9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward) 4266
9.9.2.1_1.1 Test purpose 4266
9.9.2.1_1.2 Test applicability 4266
9.9.2.1_1.3 Minimum conformance requirements 4266
9.9.2.1_1.4 Test description 4267
9.9.2.1_1.4.1 Initial conditions 4267
9.9.2.1_1.4.2 Test procedure 4267
9.9.2.1_1.5 Test requirement 4268
9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy 4270
9.9.2.2.1 Test purpose 4270
9.9.2.2.2 Test applicability 4270
9.9.2.2.3 Minimum conformance requirements 4270
9.9.2.2.4 Test description 4271
9.9.2.2.4.1 Initial conditions 4271
9.9.2.2.4.2 Test procedure 4272
9.9.2.2.4.3 Message contents 4272
9.9.2.2.5 Test requirement 4272
9.10 4274
9.11 RSSI Accuracy 4274

9.11.1 FS3 average RSSI accuracy case (PCell using FDD) 4274
9.11.1.1 Test purpose 4274
9.11.1.2 Test applicability 4274
9.11.1.3 Minimum conformance requirements 4274
9.11.1.4 Test description 4275
9.11.1.4.1 Initial conditions 4275
9.11.1.4.2 Test procedure 4275
9.11.1.4.3 Message contents 4276
9.11.1.5 Test requirement 4276
9.11.2 FS3 average RSSI accuracy case (PCell using TDD) 4278
9.11.2.1 Test purpose 4278
9.11.2.2 Test applicability 4278
9.11.2.3 Minimum conformance requirements 4278
9.11.2.4 Test description 4278
9.11.2.4.1 Initial conditions 4278
9.11.2.4.2 Test procedure 4279
9.11.2.4.3 Message contents 4279
9.11.2.5 Test requirement 4279
9.12 Channel Occupancy 4281
9.12.1 FS3 channel occupancy test (PCell using FDD) 4281
9.12.1.1 Test purpose 4281
9.12.1.2 Test applicability 4281
9.12.1.3 Minimum conformance requirements 4281
9.12.1.4 Test description 4282
9.12.1.4.1 Initial conditions 4282
9.12.1.4.2 Test procedure 4282
9.12.1.4.3 Message contents 4282
9.12.1.5 Test requirement 4284
9.12.2 FS3 channel occupancy test (PCell using TDD) 4285
9.12.2.1 Test purpose 4285
9.12.2.2 Test applicability 4285
9.12.2.3 Minimum conformance requirements 4285
9.12.2.4 Test description 4285
9.12.2.4.1 Initial conditions 4285
9.12.2.4.2 Test procedure 4287
9.12.2.4.3 Message contents 4287
9.12.2.5 Test requirement 4287

10 Proximity-based Services in Any Cell Selection 4288
10.1 FFS 4288
10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication 4288
10.2.1 Test purpose 4289
10.2.2 Test applicability 4289
10.2.3 Minimum conformance requirements 4289
10.2.4 Test description 4289
10.2.4.1 Initial conditions 4289
10.2.4.2 Test procedure 4290
10.2.4.3 Message contents 4291
10.2.5 Test requirement 4291
10.3 FFS 4292
10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication 4292
10.4.1 Test purpose 4292
10.4.2 Test applicability 4292
10.4.3 Minimum conformance requirements 4293
10.4.4 Test description 4293
10.4.4.1 Initial conditions 4293
10.4.4.2 Test procedure 4295
10.4.4.3 Message contents 4295
10.4.5 Test requirement 4295

11 V2V Sidelink Communication for V2V Operation on Dedicated V2V Carrier 4297
11.1 V2V UE Transmission Timing Accuracy Test 4297

11.1.1 Test purpose 4297
11.1.2 Test applicability 4297
11.1.3 Minimum conformance requirements 4297
11.1.4 Test description 4297
11.1.4.1 Initial conditions 4297
11.1.4.2 Test procedure 4298
11.1.4.3 Message contents 4298
11.1.5 Test requirement 4299
11.2 Interruptions due to V2V sidelink communication 4300
11.2.1 Test purpose 4300
11.2.2 Test applicability 4300
11.2.3 Minimum conformance requirements 4300
11.2.4 Test description 4300
11.2.4.1 Initial conditions 4300
11.2.4.2 Test procedure 4301
11.2.4.3 Message contents 4301
11.2.5 Test requirement 4301

12 V2X Communications 4302
12.1 V2X UE Transmission Timing Accuracy Test 4302
12.1.1 V2X UE Transmission Timing Accuracy Test for eNB as Timing Reference 4302
12.1.1.1 Test Purpose 4302
12.1.1.2 Applicability of requirements 4303
12.1.1.3 Minimum Conformance Requirements 4303
12.1.1.4 Test Description 4303
12.1.1.4.1 Initial Conditions 4303
12.1.1.4.2 Test Procedure 4304
12.1.1.4.3 Message Contents 4304
12.1.1.5 Test Requirement 4304
12.1.2 V2X UE Transmission Timing Accuracy Test for SyncRef UE as Timing Reference 4305
12.1.2.1 Test Purpose 4305
12.1.2.2 Applicability of requirements 4305
12.1.2.3 Minimum Conformance Requirements 4305
12.1.2.4 Test Description 4306
12.1.2.4.1 Initial Conditions 4306
12.1.2.4.2 Test Procedure 4306
12.1.2.4.3 Message Contents 4306
12.1.2.5 Test Requirement 4307
12.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication 4308
12.2.1 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for eNB as Timing Reference 4308
12.2.1.1 Test purpose 4308
12.2.1.2 Test applicability 4308
12.2.1.3 Minimum conformance requirements 4308
12.2.1.4 Test description 4308
12.2.1.4.1 Initial conditions 4308
12.2.1.4.2 Test procedure 4309
12.2.1.4.3 Message contents 4310
12.2.1.5 Test requirement 4313
12.2.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for SyncRef UE as Timing Reference 4314
12.2.2.1 Test purpose 4314
12.2.2.2 Test applicability 4314
12.2.2.3 Minimum conformance requirements 4314
12.2.2.4 Test description 4315
12.2.2.4.1 Initial conditions 4315
12.2.2.4.2 Test procedure 4315
12.2.2.4.3 Message contents 4316
12.2.2.5 Test requirement 4318
12.3 V2X Synchronization Reference Selection/Reselection Tests 4319
12.3.1 V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority 4319

12.3.1.1 Test Purpose 4319
12.3.1.2 Applicability of requirements 4319
12.3.1.3 Minimum Conformance Requirements 4319
12.3.1.4 Test Description 4320
12.3.1.4.1 Initial Conditions 4320
12.3.1.4.2 Test Procedure 4321
12.3.1.4.3 Message Contents 4321
12.3.1.5 Test Requirement 4324
12.3.2 V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority 4326
12.3.2.1 Test Purpose 4326
12.3.2.2 Applicability of requirements 4326
12.3.2.3 Minimum Conformance Requirements 4326
12.3.2.4 Test Description 4327
12.3.2.4.1 Initial Conditions 4327
12.3.2.4.2 Test Procedure 4328
12.3.2.4.3 Message Contents 4328
12.3.2.5 Test Requirement 4331
12.4 Congestion Control Measurement Test for V2X UE 4332
12.4.1 Test Purpose 4332
12.4.2 Test applicability 4332
12.4.3 Minimum conformance requirements 4332
12.4.4 Test description 4333
12.4.4.1 Initial conditions 4333
12.4.4.2 Test procedure 4334
12.4.4.3 Message contents 4335
12.4.5 Test requirement 4336
12.5 Interruptions due to V2X Sidelink Communication 4338
12.5.1 Test Purpose 4338
12.5.2 Applicability of requirements 4338
12.5.3 Minimum Conformance Requirements 4339
12.5.4 Test Description 4339
12.5.4.1 Initial Conditions 4339
12.5.4.2 Test Procedure 4340
12.5.4.3 Message Contents 4340
12.5.5 Test Requirement 4342
12.6 V2X UE Autonomous Resource Selection/Reselection Measurement Test 4343
12.6.1 V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements 4343
12.6.1.1 Test Purpose 4343
12.6.1.2 Applicability of requirements 4344
12.6.1.3 Minimum Conformance Requirements 4344
12.6.1.4 Test Description 4344
12.6.1.4.1 Initial Conditions 4344
12.6.1.4.2 Test Procedure 4345
12.6.1.4.3 Message Contents 4346
12.6.1.5 Test Requirement 4348
12.6.2 V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements 4349
12.6.2.1 Test Purpose 4349
12.6.2.2 Applicability of requirements 4349
12.6.2.3 Minimum Conformance Requirements 4349
12.6.2.4 Test Description 4349
12.6.2.4.1 Initial Conditions 4349
12.6.2.4.2 Test Procedure 4350
12.6.2.4.3 Message Contents 4351
12.6.2.5 Test Requirement 4352

Annex A (normative): Reference Measurement Channels 4354

A.1 PDSCH 4354
A.1.1 FDD 4354
A.1.2 TDD 4358
A.1.3 FDD for UE Category 0 4361

A.1.4 HD-FDD for UE Category 0 4362
A.1.5 TDD for UE Category 0 4363
A.1.6 Frame Structure 3 4364
A.2 PCFICH/PDCCH/PHICH 4365
A.2.1 FDD 4365
A.2.2 TDD 4365
A.2.3 HD-FDD for UE category 0 4366
A.2.4 FS 3 4366
A.3 PUSCH 4366
A.4 Reference Measurement Channels for ProSe Direct Discovery 4367
A.4.1 FDD 4367
A.5 Reference measurement channels for ProSe Direct Communication 4367
A.5.1 FDD 4367
A.6 ProSe Receive Traffic Generator 4368
A.6.1 ProSe Direct Communication Receive Traffic Generator for FDD 4368
A.6.2 ProSe Direct Discovery Receive Traffic Generator for FDD 4369
A.7 MPDCCH Reference Channels for Cat-M1 UEs 4369
A.7.1 FDD in CEModeA 4369
A.7.2 HD-FDD in CEModeA 4370
A.7.3 TDD in CEModeA 4370
A.7.4 FDD in CEModeB 4371
A.7.5 HD-FDD in CEModeB 4371
A.7.6 TDD in CEModeB 4372
A.8 PDSCH Reference Channels for Cat-M1 UEs 4373
A.8.1 FDD in CEModeA 4373
A.8.2 HD-FDD in CEModeA 4374
A.8.3 TDD in CEModeA 4375
A.8.4 FDD in CEModeB 4376
A.8.5 HD-FDD in CEModeB 4377
A.8.6 TDD in CEModeB 4378
A.9 Reference PRACH Configurations 4379
A.10 General configuration for NB-IoT 4379
A.10.1 NPDCCH Reference Channel for UE category NB1 4380
A.10.1.1 In-band operation 4380
A.10.1.2 Standalone operation 4381
A.10.1.3 Guard band operation 4381
A.10.2 NPDSCH Reference Channel for UE category NB1 4382
A.10.2.1 HD-FDD in-band operation 4382
A.10.2.2 HD-FDD standalone operation 4383
A.10.2.3 HD-FDD guard band operation 4383
A.10.2.4 TDD in-band operation 4384
A.10.2.5 TDD standalone operation 4384
A.10.2.6 TDD guard band operation 4385
A.10.3 Reference NPRACH Configurations 4385
A.11 V2V Sidelink Communication on Dedicated V2V Carrier 4387
A.11.1 Introduction 4387
A.11.2 Reference resource pool configurations for V2V Sidelink Communication 4388
A.11.3 Reference measurement channels for V2V Sidelink Communication 4389
A.12 V2X sidelink communication 4390
A.12.1 Introduction 4390
A.12.2 Reference resource pool configurations for V2X Sidelink Communication 4390
A.12.3 Reference measurement channels for V2X Sidelink Communication 4393
Annex B (normative): Propagation Conditions 4395

B.0 No interference 4395
B.1 Static propagation condition 4395
B.2 Multi-path fading Propagation Conditions 4395

Annex C (normative): Downlink Physical Channels 4396

C.0 Downlink signal 4396
C.1 General 4396
C.2 Set-up 4396
C.3 Test specific scenarios 4396
C.3.1 ABS Transmission Configurations 4396
C.3.1.1 Non-MBSFN ABS Transmission Configurations 4396
C.3.1.1.1 Non-MBSFN ABS Transmission, 1x2 antenna with PBCH 4396
C.3.1.1.2 Non-MBSFN ABS Transmission, 2x2 antenna without PBCH 4397
C.3.1.2 MBSFN ABS Transmission Configurations 4398
C.3.1.2.1 MBSFN ABS Transmission, 1x2 antenna 4398
C.3.1.2.2 MBSFN ABS Transmission, 2x2 antenna 4398
C.3.2 Impact of Reference Sensitivity Degradation with Carrier Aggregation on Test Cases 4399
C.3.2.1 Impact of Reference Sensitivity Degradation due to Insertion Loss 4399
C.3.3 Carrier Aggregation Test Cases with Different Channel Bandwidth Combinations 4399
C.3.3.1 Introduction 4399
C.3.4 Proximity-based Services 4399
C.3.4.1 Introduction 4399
C.3.4.2 Reference DRX configurations for ProSe tests 4400
C.3.4.3 Test Cases with Different Channel Bandwidths 4400
C.3.4.3.1 Introduction 4400
C.3.4.3.2 Principle of testing 4400
C.3.5 Listen before talk model 4400
C.3.5.1 Introduction 4400
C.3.5.2 Definition 4400

Annex D (normative): OFDMA Channel Noise Generator (OCNG) 4401

D.1 OCNG Patterns for FDD 4401
D.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz 4402
D.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz 4403
D.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz 4404
D.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz 4405
D.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN) 4405
D.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN) 4406
D.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN) 4406
D.1.8 OCNG FDD pattern 8: outer resource blocks allocation in 10 MHz for MBSFN ABS 4407
D.1.9 OCNG FDD pattern 9: full bandwidth allocation in 10 MHz for MBSFN ABS 4407
D.1.10 OCNG FDD pattern 10: outer resource blocks allocation in 10 MHz with user data in every SF (without MBSFN) 4408
D.1.11 OCNG FDD pattern 11: outer resource blocks allocation in 20 MHz 4408
D.1.12 OCNG FDD pattern 12: full bandwidth allocation in 20 MHz 4409
D.1.13 OCNG FDD pattern 13: outer resource blocks allocation in 20 MHz (without MBSFN) 4410
D.1.14 OCNG FDD pattern 14: full bandwidth allocation in 20 MHz (without MBSFN) 4411
D.1.15 OCNG FDD pattern 15: outer resource blocks allocation in 5 MHz 4411
D.1.16 OCNG FDD pattern 16: full bandwidth allocation in 5 MHz 4412
D.1.17 OCNG FDD pattern 17: outer resource blocks allocation in 20 MHz with user data in every subframe (without MBSFN) 4413
D.1.18 OCNG FDD pattern 18: outer resource blocks allocation in 5 MHz (without MBSFN) 4413
D.1.19 OCNG FDD pattern 19: full bandwidth allocation in 5 MHz (without MBSFN) 4414
D.1.20 OCNG FDD pattern 20: outer resource blocks allocation in 5 MHz with user data in every subframe (without MBSFN) 4414
D.1.21 OCNG FDD pattern 21: Generic resource blocks allocation (without MBSFN) 4415
D.2 OCNG Patterns for TDD 4415

D.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz 4416
D.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz 4416
D.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz 4417
D.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz 4417
D.2.5 OCNG TDD pattern 5: outer resource blocks allocation in 10 MHz for MBSFN ABS 4418
D.2.6 OCNG TDD pattern 6: full bandwidth allocation in 10 MHz for MBSFN ABS 4419
D.2.7 OCNG TDD pattern 7: outer resource blocks allocation in 20 MHz 4420
D.2.8 OCNG TDD pattern 8: full bandwidth allocation in 20 MHz 4420
D.2.9 OCNG TDD pattern 9: outer resource blocks allocation in 5 MHz 4421
D.2.10 OCNG TDD pattern 10: full bandwidth allocation in 5 MHz 4422
D.2.11 OCNG TDD pattern 11: Generic resource blocks allocation (without MBSFN) 4422

D.3 OCNG Patterns for Narrowband IoT 4423
D.3.1 Narrowband IoT OCNG FDD pattern 1: In-band NB-IoT in 10 MHz EUTRAN cell 4424
D.3.2 Narrowband IoT OCNG FDD pattern 2: guard band NB-IoT in 10 MHz EUTRAN cell 4425
D.3.3 Narrowband IoT OCNG FDD pattern 3: standalone NB-IoT 4426
D.3.4 Narrowband IoT OCNG FDD pattern 4: In-band NB-IoT in 5 MHz EUTRAN cell 4427
D.3.5 Narrowband IoT OCNG FDD pattern 5: guard band NB-IoT in 5 MHz EUTRAN cell 4428
D.3.6 Narrowband IoT OCNG TDD pattern 1: In-band NB-IoT in 10 MHz EUTRAN cell 4429
D.3.7 Narrowband IoT OCNG TDD pattern 2: guard band NB-IoT in 10 MHz EUTRAN cell 4430
D.3.8 Narrowband IoT OCNG TDD pattern 3: standalone NB-IoT 4431

D.4 OCNG Patterns for V2X sidelink 4431
D.4.1 V2X sidelink OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz 4432
D.4.2 V2X sidelink OCNG TDD pattern 2: outer resource blocks allocation in 10 MHz 4432

Annex E (normative): Cell configuration mapping 4433

Annex F (normative): Measurement uncertainties and Test Tolerances 4484

F.1 Acceptable uncertainty of Test System (normative) 4484
F.1.1 Measurement of test environments 4484
F.1.2 Measurement of RRM requirements 4485

F.2 Interpretation of measurement results (normative) 4571

F.3 Test Tolerance and Derivation of Test Requirements (informative) 4571
F.3.1 Measurement of test environments 4571
F.3.2 Measurement of RRM requirements 4571

Annex G (normative): Statistical Testing 4693

G.1 General 4693

G.2 Statistical testing of delay and UE measurement performance in RRM tests 4693
G.2.1 General 4693
G.2.2 Design of the test 4693
G.2.3 Numerical definition of the pass fail limits 4694
G.2.4 Pass fail decision rules 4694
G.2.5 Void 4695
G.2.6 Test conditions for delay tests and UE measurement performance 4695

G.X Theory to derive the numbers in Table G.2.3-1 (informative) 4695

Annex H (normative): Default Message Contents 4696

H.1 Common contents of system information messages exceptions 4696

H.2 Common contents of system information blocks exceptions 4696
H.2.1 System information blocks message contents exceptions for E-UTRAN intra frequency cell re-selection 4696
H.2.2 System information blocks message contents exceptions for E-UTRAN inter frequency cell re-selection 4697
H.2.3 System information blocks message contents exceptions for E-UTRAN inter-RAT cell re-selection 4698
H.2.4 System information blocks message contents exceptions for E-UTRAN radio link monitoring (RLM) 4703
H.2.5 System information blocks message contents exceptions for RRC Re-establishment 4704
H.2.6 System information block messages and information elements contents exceptions for E-UTRAN Random Access 4705

H.2.7 System information blocks message contents exceptions for eICIC/feICIC 4706
H.2.8 System information blocks message contents exceptions for eMTC 4707
H.2.9 System information blocks message contents exceptions for HD-FDD radio link monitoring (RLM) for UE Category NB1 4707

H.3 Default RRC messages and information elements contents exceptions 4708
H.3.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration 4708
H.3.2 RRC messages and information elements contents exceptions for E-UTRAN cell re-selection and handover 4721
H.3.3 RRC messages and information elements contents exceptions for E-UTRAN inter-RAT handover 4722
H.3.4 RRC messages and information elements exceptions for E-UTRAN UE transmit timing accuracy and UE timing advance adjustment accuracy 4724
H.3.5 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy 4725
H.3.6 RRC messages and information elements contents exceptions for E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search 4730
H.3.7 RRC messages and information elements contents exceptions for E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX is used 4732
H.3.8 RRC messages and information elements contents exceptions for E-UTRAN CSI-RSRP Accuracy 4734
H.3.9 RRC messages and information elements contents exceptions for RSSI Accuracy 4738

H.4 Default RRC messages and information elements contents exceptions for Carrier Aggregation 4740
H.4.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for CA 4740
H.4.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for CA 4748

H.5 Default RRC messages and information elements contents exceptions for FeICIC 4751
H.5.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for FeICIC 4752
H.5.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for FeICIC 4754

H.6 Default RRC messages and information elements contents exceptions for Proximity based services 4755
H.6.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for Proximity based services 4756
H.6.1.1 Reference resource pool configurations for ProSe Direct Discovery 4756
H.6.1.2 Reference resource pool configurations for ProSe Direct Communication 4759

H.7 Default RRC messages and information elements contents exceptions for eMTC 4760
H.7.1 RRC messages and information elements contents exceptions for eMTC 4761

Annex I (normative): Conditions for RRM requirements applicability for operating bands .4762

I.1 Conditions for E-UTRAN RRC_IDLE state mobility 4762
I.1.1 Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection 4762
I.1.2 Conditions for measurements of inter-frequency E-UTRAN cells for cell re-selection 4762
I.1.3 4762
I.1.4 Conditions for measurements of intra-frequency NB-IoT cells for cell re-selection for UE Category NB1 4762
I.1.5 Conditions for measurements of inter-frequency NB-IoT cells for cell re-selection for UE Category NB1 4763

I.2 Conditions for UE Measurements Procedures in RRC_CONNECTED State 4764
I.2.1 Conditions for E-UTRAN intra-frequency measurements 4764
I.2.2 Conditions for E-UTRAN intra-frequency measurements with autonomous gaps 4764
I.2.3 Conditions for E-UTRAN inter-frequency measurements 4764
I.2.4 Conditions for E-UTRAN inter-frequency measurements with autonomous gaps 4765
I.2.5 Void 4765
I.2.6 Void 4765
I.2.7 Conditions for Measurements of the secondary component carrier with deactivated SCell 4765

I.2.8 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction 4766
I.2.9 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction with CRS Assistance Information 4766
I.2.10 Conditions for E-UTRAN intra-frequency discovery signal measurements 4767
I.2.11 Conditions for E-UTRAN inter-frequency discovery signal measurements 4767
I.2.11.1 Conditions for E-UTRAN inter-frequency CRS-based measurements 4767
I.2.11.2 Conditions for E-UTRAN inter-frequency CSI-RS based measurements 4768
I.2.12 to I.2.14 4768
I.2.15 Conditions for NB-IoT intra-frequency measurements by UE Category NB1 4768
I.2.16 Conditions for NB-IoT intra-frequency RSTD measurements by UE Category NB1 4769
I.2.17 Conditions for NB-IoT inter-frequency RSTD measurements by UE Category NB1 4770

I.3 Conditions for measurements performance requirements for UE 4771
I.3.1 Conditions for intra-frequency RSRP and RSRQ Accuracy Requirements 4771
I.3.2 Void 4771
I.3.3 Conditions for inter-frequency RSRP and RSRQ Accuracy Requirements 4771
I.3.4 Conditions for inter-frequency relative RSRP and RSRQ Accuracy Requirements 4771
I.3.5 to I.3.7 Void 4772
I.3.8 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements 4772
I.3.9 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction 4772
I.3.10 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction 4772
I.3.11 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information 4772
I.3.12 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information 4773
I.3.13 Void 4773
I.3.14 Conditions for Intra-Frequency Absolute Discovery Signal Measurement Accuracy Requirements 4773
I.3.14.1 Conditions for Intra-frequency CRS-based measurements 4773
I.3.14.2 Conditions for Intra-frequency CSI-RS-based measurements 4773
I.3.15 Conditions for Intra-Frequency Relative Discovery Signal Measurement Accuracy Requirements 4774
I.3.15.1 Conditions for Intra-frequency CRS-based measurements 4774
I.3.15.2 Conditions for Intra-frequency CSI-RS-based measurements 4774
I.3.16 Conditions for Inter-Frequency Absolute Discovery Signal Measurement Accuracy Requirements 4774
I.3.16.1 Conditions for Inter-frequency CRS-based measurements 4774
I.3.16.2 Conditions for Inter-frequency CSI-RS-based measurements 4774
I.3.17 Conditions for Inter-Frequency Relative Discovery Signal Measurement Accuracy Requirements 4775
I.3.17.1 Conditions for Inter-frequency CRS-based measurements 4775
I.3.17.2 Conditions for Inter-frequency CSI-RS-based measurements 4775
I.3.18 to I.3.24 4775
I.3.25 Conditions for NB-IoT intra-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1 4775
I.3.26 Conditions for NB-IoT inter-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1 4775

I.4 RRM Requirements Exceptions 4776
I.4.1 General 4776
I.4.2 Receiver sensitivity relaxation for UE supporting CA 4776
I.4.3 Receiver sensitivity relaxation for UE configured with CA 4776
I.4.3.1 Inter-band carrier aggregation 4776
I.4.3.2 Intra-band non-contiguous carrier aggregation 4776
I.4.3.3 Inter-band carrier aggregation with operating bands without uplink band 4776

I.5 Void 4777

I.6 Conditions for V2X 4777
I.6.1 Void 4777
I.6.2 Conditions for Absolute S-RSRP Accuracy Requirements 4777
I.6.3 Conditions for Relative S-RSRP Accuracy Requirements 4777
I.6.4 Conditions for Selection/Reselection to Intra-frequency SyncRef UE 4777
I.6.5 Conditions for Absolute PSSCH-RSRP Accuracy Requirements 4778

I.7 Conditions for sTTI and 1ms-TTI with 3 Subframe HARQ Processing....4778
I.7.1 Conditions for Maximum Timing Difference Between Uplink and Downlink Carriers in Carrier Aggregation....4778

Annex J (informative): Handling requirements and tests for different releases and UE capabilities....4780

J.1 General considerations....4780

J.2 Concrete scenarios....4780
J.2.1 Tests for minimum requirements varying between releases, without introduction of new features....4780
J.2.2 Void....4780

Annex K (informative): Change history....4781

History....4849

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part 3 of a multi-parts TS:

3GPP TS 36.521-1 [10]: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 1: Conformance Testing.

3GPP TS 36.521-2 [23]: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS).

3GPP TS 36.521-3: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 3: Radio Resource Management (RRM) conformance testing.

1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain requirements for support of RRM (Radio Resource Management) as part of the 3G Long Term Evolution (3G LTE).

The requirements are listed in different clauses only if the corresponding parameters deviate. More generally, tests are only applicable to those mobiles that are intended to support the appropriate functionality. To indicate the circumstances in which tests apply, this is noted in the "*test applicability*" part of the test.

For example only Release 8 and later UE declared to support LTE shall be tested for this functionality. In the event that for some tests different conditions apply for different releases, this is indicated within the text of the test itself.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[3] ITU-R Recommendation SM.329-10, "Unwanted emissions in the spurious domain".

[4] 3GPP TS 36.133: "E-UTRA requirements for support of radio resource management".

[5] 3GPP TS 36.331: "E-UTRA Radio Resource Control (RRC): protocol specification".

[6] 3GPP TS 36.304: "E-UTRA UE procedures in idle mode".

[7] 3GPP TS 36.508: "Common test environments for User Equipment (UE)".

[8] 3GPP TS 36.213: "E-UTRA Physical layer procedures".

[9] 3GPP TS 36.211: "E-UTRA Physical Channels and Modulation".

[10] 3GPP TS 36.521-1: "User Equipment (UE) conformance specification Radio transmission and reception. Part 1: Conformance Testing".

[11] 3GPP TS 36.321: "E-UTRA Medium Access Control (MAC): protocol specification".

[12] 3GPP TS 36.214: "E-UTRA Physical layer - Measurements".

[13] 3GPP TS 45.010: "Radio subsystem synchronization".

[14] 3GPP TS 36.306: "E-UTRA UE radio access capabilities".

[15] 3GPP TS 45.008: "Radio subsystem link control".

[16] 3GPP TS 45.005: "Radio transmission and reception"

[17] 3GPP2 C.S0033-B: "Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal".

[18] 3GPP2 C.S0024-B: "cdma2000 High Rate Packet Data Air Interface Specification".

[19] 3GPP2 C.S0011-C: “Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations”.

[20] 3GPP TR 36.903: "Derivation of test tolerances for Radio Resource Management (RRM) conformance tests ".

[21] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[22] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[23] 3GPP TS 36.521-2: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS)".

[24] 3GPP TS 34.108: “UTRA Common test environments for User Equipment (UE)".

[25] 3GPP TS 36.521-3 Release 10: "User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management (RRM) conformance testing".

[26] 3GPP TS 36.321: “Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification”.

[27] 3GPP TS 37.571-1: User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification.

[28] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)".

[29] 3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception".

[30] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[31] IEEE Standard 802.11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Asynchronous Dual Connectivity: As defined in TS 36.300 [30].

BL UE: A Bandwidth-reduced Low-complexity UE.

BL/CE UE: A Bandwidth-reduced Low-complexity or Coverage Enhanced (BL/CE) UE that is capable of coverage enhancement mode A and/or B support and intends to access a cell in a coverage enhancement mode or is configured in a coverage enhancement mode.

Carrier aggregation: Aggregation of two or more component carriers in order to support wider transmission bandwidths.

Carrier aggregation band: A set of one or more operating bands across which multiple carriers are aggregated with a specific set of technical requirements.

Carrier aggregation bandwidth class: A class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by a UE.

Carrier aggregation configuration: A combination of CA operating band(s) and CA bandwidth class(es) supported by a UE.

CE UE: UE supporting CEModeA and optionally CEModeB.

Channel edge: The lowest and highest frequency of the carrier, separated by the channel bandwidth.

Channel bandwidth: The RF bandwidth supporting a single E-UTRA RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell. The channel bandwidth is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

Contiguous carriers: A set of two or more carriers configure in a spectrum block where there are no RF requirements based on co-existence for un-coordinated operation within the spectrum block.

Dual Connectivity: As defined in TS 36.300 [30].

High operating band: an operating band with a higher downlink frequency with respect to another, low, operating band.

Inter-band carrier aggregation: Carrier aggregation of component carriers in different operating bands.

NOTE: Carriers aggregated in each band can be contiguous or non-contiguous

Intra-band carrier aggregation: Contiguous carriers aggregated in the same operating band.

Intra-band non-contiguous carrier aggregation: Non-contiguous carriers aggregated in the same operating band.

Low operating band: an operating band with a lower downlink frequency with respect to another, high, operating band.

Non-BL/CE UE: A non-BL/CE UE is a UE that does not fulfil the conditions in the definition of a BL/CE UE.

Non-BL CE: A Non-Bandwidth-reduced Low-complexity UE supporting CEModeA and optionally CEModeB.

Master Cell Group: As defined in TS 36.300 [30].

Master eNB: As defined in TS 36.300 [30].

Maximum throughput: The maximum achievable throughput for a reference measurement channel.

Maximum Output Power: The mean power level per carrier of UE measured at the antenna connector in a specified reference condition.

Mean power: When applied to E-UTRA transmission this is the power measured in the operating system bandwidth of the carrier. The period of measurement shall be at least one subframe (1ms) unless otherwise stated.

NB-IoT: NB-IoT allows access to network services via E-UTRA with a channel bandwidth limited to 200 kHz.

NB-IoT stand-alone operation: A NB-IoT is operating standalone when it utilizes its own spectrum, for example the spectrum used by GERAN systems as a replacement of one or more GSM carriers, as well as scattered spectrum for potential IoT deployment.

NB-IoT guard band operation: NB-IoT is operating in guard band when it utilizes the unused resource block(s) within an E-UTRA carrier's guard-band

NB-IoT in-band operation: NB-IoT is operating in-band when it utilizes the resource block(s) within a normal E-UTRA carrier

Normal Performance Group: For UE which supports Increased UE carrier monitoring UTRA or E-UTRA the group of inter-frequency carriers or inter-RAT carriers is divided into two groups. The group which has a better delay performance compared to the other group is referred to as the normal performance group

Occupied bandwidth: The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean power of a given emission.

Output power: The mean power of one carrier of the UE, delivered to a load with resistance equal to the nominal load impedance of the transmitter.

Primary Cell: As defined in TS 36.331 [5] subclause 3.1.

Primary SCell: As defined in TS 36.300 [30].

Primary Secondary Timing Advance Group: Timing Advance Group containing the PSCell.

Primary Timing Advance Group: Timing Advance Group containing the PCell.

Reduced Performance Group: For UE which supports Increased UE carrier monitoring UTRA or E-UTRA the group of inter-frequency carriers or inter-RAT carriers is divided into two groups. The group which has worse delay performance compared to the other group is referred to as the reduced performance group

Secondary Cell: As defined in TS 36.331 [5] subclause 3.1.

Serving Cell: As defined in TS 36.331 [5] subclause 3.1.

Secondary Cell Group: As defined in TS 36.300 [30].

Secondary Timing Advance Group: As defined in TS 36.331 [5].

sTTI: A transmission time interval (TTI) of either one slot or one subslot transmission duration as defined in TS 36.211 [9] on either uplink or downlink.

Synchronous Dual Connectivity: As defined in TS 36.300 [25].

TDD configuration with CA: The same uplink-downlink and special subframe configurations [9] in the PCell and SCell are assumed unless otherwise stated.

TDD configuration with inter-frequency: The same uplink-downlink and special subframe configurations [9] in all the cells on the serving and inter-frequency carriers are assumed unless otherwise stated.

Throughput: The number of payload bits successfully received per second for a reference measurement channel in a specified reference condition.

Timing Advance Group: As defined in TS 36.331 [5].

Transmission bandwidth: Bandwidth of an instantaneous transmission from a UE or BS, measured in Resource Block units.

Transmission bandwidth configuration: The highest transmission bandwidth allowed for uplink or downlink in a given channel bandwidth, measured in Resource Block units.

UE category 0 applicability: The requirements for a UE category 0 are derived assuming UE category 0 [14] and a single antenna receiver.

UE category M1 applicability: The requirements for UE category M1 are derived assuming: DL Category M1 and Uplink Category M1, operation in any LTE system bandwidth but with a channel bandwidth of 1.4 MHz and transmission bandwidth of 6 PRBs in downlink and uplink, and a single antenna receiver. DL UE category M1 and UL UE category M1 are defined in TS 36.306 [14]. The requirements for CEMode A shall apply provided the UE category M1 is configured with CEMode A, SCH $\hat{E}s/Iot \geq -6$ dB and CRS $\hat{E}s/Iot \geq -6$ dB. The CEMode A and the number of repetition levels for different physical channels are defined in TS 36.213 [8]. The requirements for CEMode B shall apply provided the UE category M1 is configured with CEMode B, SCH $\hat{E}s/Iot \geq -15$ dB and CRS $\hat{E}s/Iot \geq -15$ dB. The CEMode B and the number of repetition levels for different physical channels are defined in TS 36.213 [8].

UE category NB1 applicability: The requirements for UE category NB1 are derived assuming UE category NB1[14] and a single antenna receiver.

V2X Communication: V2X (Vehicle to Everything) service is operating in ITS spectrum and/or LTE licensed operating bands.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

$BW_{Channel}$	Channel bandwidth, defined in TS 36.101 subclause 3.2
$BW_{Channel\_CA}$	Aggregated channel bandwidth, expressed in MHz, defined in TS 36.101 subclause 3.2.
CPICH_Ec	Average energy per PN chip for the CPICH

CPICH_Ec/Io The ratio of the received energy per PN chip for the CPICH to the total received power spectral density at the UE antenna connector.
Ec Average energy per PN chip
Ês Received energy per RE (power normalized to the subcarrier spacing) during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna connector
Io The total received power density, including signal and interference, as measured at the UE antenna connector.
Ioc The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.
Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector
N_{oc} The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector
n_{PRB} Physical Resource Block number as defined in subclause 3.1 in 3GPP TS 36.211.
P_{CMAX} Configured UE transmitted power as defined in subclause 6.2.5 in 3GPP TS 36.101.
$Q_{out\_Cat\ M1}$ Defined in TS 36.133 clause 7.19.2
$Q_{in\_Cat\ M1}$ Defined in TS 36.133 clause 7.19.2
S Defined in TS 36.304, subclause 5.2.3.2 for E-UTRAN
SCH_Ec/Ior The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral density at the UTRA Node B antenna connector
SCH_RP Received (linear) average power of the resource elements that carry E-UTRA synchronisation signal, measured at the UE antenna connector
$S_{ServingCcell}$ Defined in TS 36.304
Sintersearch Defined in TS 25.304, subclause 5.2.6.1.5
Sintrasearch Defined in TS 25.304, subclause 5.2.6.1.5 for UTRAN and in TS 36.304, subclause 5.2.4.7 for E-UTRAN
Snonintrasearch Defined in TS 36.304, subclause 5.2.4.7
SsearchRAT Defined in TS 25.304, subclause 5.2.6.1.5
$Thresh_{x,\ high}$ Defined in TS 36.304, subclause 5.2.4.7
$Thresh_{x,\ low}$ Defined in TS 36.304, subclause 5.2.4.7
$Thresh_{serving,\ low}$ Defined in TS 36.304, subclause 5.2.4.7
$T_{RE\text{-}ESTABLISH\text{-}REQ}$ The RRC Re-establishment delay requirement, the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH.
Treselection Defined in TS 25.304, subclause 5.2.6.1.5
$Treselection_{RAT}$ Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{EUTRAN}$ Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{UTRAN}$ Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{GERAN}$ Defined in TS 36.304, subclause 5.2.4.7
T_S Basic time unit, defined in TS 36.211, clause 4

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

1x RTT CDMA2000 1x Radio Transmission Technology
ABS Almost Blank Subframe
ARQ Automatic Repeat Request
AWGN Additive White Gaussian Noise
BCCH Broadcast Control Channel
BCH Broadcast Channel
BS Base Station
BSIC Base transceiver Station Identity Code
CA Carrier Aggregation

CC	Component Carriers
CCCH SDU	Common Control Channel SDU
CCTrCH	Coded Composite Transport Channel
CFN	Connection Frame Number
CPICH	Common Pilot Channel
CPICH Ec/No	CPICH received energy per chip divided by the power density in the band
CRS	Cell-specific Reference Signals
C-RNTI	Cell RNTI
CQI	Channel Quality Indicator
CSI	Channel-State Information
CSI-RS	CSI Reference Signal
DC	Dual Connectivity
DCI	Downlink Control Information
DCCH	Dedicated Control Channel
DL	Downlink
DPCH	Dedicated Physical Channel
DPCCH	Dedicated Physical Control Channel
DRX	Discontinuous Reception
DTX	Discontinuous Transmission
DwPTS	Downlink Pilot Time-Slot
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
EPRE	Energy Per Resource Element
eICIC	Enhanced Inter-Cell Interference Coordination
E-UTRA	Evolved UMTS Terrestrial Radio Access
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
FDD	Frequency Division Duplex
FeICIC	Further Enhanced Inter-Cell Interference Coordination
FGI	Feature Group Indicator
FRC	Fixed Reference Channel
GSM	Global System for Mobile communication
HARQ	Hybrid Automatic Repeat Request
HD-FDD	Half- Duplex FDD
HO	Handover
HRPD	High Rate Packet Data
ICIC	Inter-Cell Interference Coordination
LWA	LTE-WLAN Aggregation
MAC	Medium Access Control
MCG	Master Cell Group
MeNB	Master eNB
MBSFN	Multimedia Broadcast multicast service Single Frequency Network
MBSFN ABS	MBSFN Almost Blank Subframe
MDT	Minimization of Drive Tests
MIB	Master Information Block
OCNG	OFDMA Channel Noise Generator
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
OTDOA	Observed Time Difference of Arrival
PBCH	Physical Broadcast Channel
PCC	Primary Component Carrier
PCCH	Paging Control Channel
P-CCPCH	Primary Common Control Physical Channel
PCell	Primary Cell
PCFICH	Physical Control Format Indicator Channel
PDCCH	Physical Downlink Control Channel
PDSCH	Physical Downlink Shared Channel
PHICH	Physical Hybrid ARQ Indicator Channel
PLMN	Public Land Mobile Network
PMI	Precoding Matrix Indicator
PRACH	Physical Random Access Channel
PSBCH	Pysical Sidelink Broadcast Channel
PSCCH	Physical Sidelink Control Channel
PSDCH	Physical Sidelink Discovery Channel

PSCell	Primary SCell
PSS	Primary Synchronization Signal
PSS_RA	PSS-to-EPRE ratio for the channel PSS
PSSCH	Physical Sidelink Shared Channel
PSSS	Primary Sidelink Synchronization Signal
psTAG	Primary Secondary Timing Advance Group
pTAG	Primary Timing Advance Group
PUCCH	Physical Uplink Control Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RAT	Radio Access Channel
REFSENS	Reference Sensitivity power level
RLC	Radio Link Control
RMC	Reference Measurement Channel
r.m.s	Root Mean Square
RNC	Radio Network Controller
RNTI	Radio Network Temporary Identifier
RRC	Radio Resource Control
RRM	Radio Resource Management
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator
SCC	Secondary Component Carrier
SCH	Synchronization Channel
SCell	Secondary Cell
SDU	Service Data Unit
SFN	System Frame Number
SNR	Signal-to-Noise Ratio
SON	Self Organizing Network
SPDCCH	Short Physical Downlink Control channel
SPUCCH	Short Physical Uplink Control channel
SRS	Sounding Reference Signal
SSS	Secondary Synchronization Signal
SSSS	Secondary Sidelink Synchornization Signal
SSS_RA	SSS-to-RS EPRE ratio for the channel SSS
sTAG	Secondary Timing Advance Group
TAG	Timing Advance Group
TDD	Time Division Duplex
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UpPTS	Uplink Pilot Time-Slot
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network
V2V	Vehicle to Vehicle
V2X	Vehicle to Everything
WB-RSRQ	Wide Bandwidth RSRQ
WLAN	Wireless Local Area Network

3.4 Void

3.5 Additional notation

3.5.1 Groups of bands

The intention with the band grouping below is to increase the readability of the specification.

Table 3.5.1-1: E-UTRA band groups

Group	E-UTRA FDD		E-UTRA TDD		E-UTRA Frame Structure 3	
	Band group notation	Operating bands	Band group notation	Operating bands	Band group notation	Operating bands
A	FDD_A	1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 32 Note 2, 67Note 2, 69Note 2, 70Note 7	TDD_A	33, 34, 35, 36, 37, 38, 39, 40, 45, 53	FS3_A	-
B	FDD_B1	65, 66 Note 5	TDD_B	-	FS3_B	-
	FDD_B2	74 Note 8				
C	FDD_C	9, 30	TDD_C	42, 43, 48	FS3_C	-
D	FDD_D	28, 68	TDD_D	-	FS3_D	-
E	FDD_E	2, 5, 7, 27	TDD_E	41, 44	FS3_E	-
F	FDD_F	26 Note 3	TDD_F	-	FS3_F	-
G	FDD_G	3, 8, 12, 13, 14, 17, 20, 22, 29 Note 2, 71, 85	TDD_G	47 Note4	FS3_G	46 Note 2
H	FDD_H	25	TDD_H	-	FS3_H	-
I	FDD_I	-	TDD_I	-	FS3_I	-
J	FDD_J	-	TDD_J	-	FS3_J	-
K	FDD_K	-	TDD_K	-	FS3_K	-
L	FDD_L	-	TDD_L	-	FS3_L	-
M	FDD_M	-	TDD_M	-	FS3_M	-
N	FDD_N	31, 72, 73, 87, 88	TDD_N	-	FS3_N	-

NOTE 1: The bands within the same group have the same Io conditions in a corresponding requirement in this specification.
NOTE 2: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands.
NOTE 3: The minimum Io condition for Band 26 is reduced by 0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: This band is used only for V2V operation.
NOTE 5: The range 2180-2200 MHz of the DL operating band 66 is restricted to E-UTRA operation when carrier aggregation is configured.
NOTE 6: Void
NOTE 7: The range 2010-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 300 MHz The range 2005-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 295 MHz.
NOTE 8: The minimum Io condition for Band 74 is reduced by 0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 1475.9-1510.9 MHz.

Table 3.5.1-2: Band groups for NB-IoT

Group	E-UTRA FDD		E-UTRA TDD	
	Band group notation	Operating bands	Band group notation	Operating bands
A	NFDD_A	-	NTDD_A	-
B	NFDD_B	-	NTDD_B	-
C	NFDD_C	-	NTDD_C	-
D	NFDD_D	-	NTDD_D	-
E	NFDD_E	-	NTDD_E	-
F	NFDD_F	-	NTDD_F	-
G	NFDD_G	1, 2, 3, 5, 8, 11, 12, 13, 17, 18, 19, 20, 25, 26, 28, 31, 66, 70, 72, 73, 74, 85, 87 88	NTDD_G	-
H	NFDD_H	-	NTDD_H	-
I	NFDD_I	-	NTDD_I	-
J	NFDD_J	-	NTDD_J	-
K	NFDD_K	-	NTDD_K	-
L	NFDD_L	-	NTDD_L	-
M	NFDD_M	-	NTDD_M	-
N	NFDD_N	-	NTDD_N	-

Table 3.5.1-3: FFS

Note: Table 3.5.1-3 is marked as FFS as Band froups for Category 0 is not yet included in TS 36.521-3.

Table 3.5.1-4: Band groups for Category M1

Group	E-UTRA FDD		E-UTRA TDD	
	Band group notation	Operating bands	Band group notation	Operating bands
A	FDD-M1_A	-	TDD-M1_A	-
B	FDD-M1_B	-	TDD-M1_B	-
C	FDD-M1_C	-	TDD-M1_C	-
D	FDD-M1_D	-	TDD-M1_D	-
E	FDD-M1_E	-	TDD-M1_E	-
F	FDD-M1_F	-	TDD-M1_F	-
G	FDD-M1_G	-	TDD-M1_G	-
H	FDD-M1_H	-	TDD-M1_H	-
I	FDD-M1_I	-	TDD-M1_I	-
J	FDD-M1_J	-	TDD-M1_J	-
K	FDD-M1_K	-	TDD-M1_K	-
L	FDD-M1_L	-	TDD-M1_L	-
M	FDD-M1_M	-	TDD-M1_M	-
N	FDD-M1_N	87, 88	TDD-M1_N	-

3A Requirements for support of RRM

3A.1 General

Radio Resource Management (RRM) ensures the efficient use of the available radio resources and also provides mechanisms that enable E-UTRAN to meet radio resource related requirements. The requirements that are tested include:

- Idle mode, the cell re-selection algorithms that are controlled by the setting of parameters (thresholds and hysteresis values) that define the best cell and/or determine when the UE should select a new cell
- The configuration of the UE measurement and reporting procedures that are transmitted via dedicated signalling in connected mode
- Connected mode, the mobility of radio connections that has to be supported
- Handover decisions that may be based on UE or eNB measurements
- Inter-RAT RRM, the management of radio resources in connection with inter-RAT mobility, e.g. Inter-RAT handover

Inter frequency and inter-RAT test cases are performed without frequency overlapping between cells required in the test.

- For bands with bandwidth not accommodating all the E-UTRAN cells required in the test without frequency overlapping, inter band testing shall be done according to subclause 3A.3.5. If the UE does not support the combination given in subclause 3A.3.5, the relevant tests are applicable only to the bands with the necessary bandwidth.
- In case when frequency overlapping occurs due to the frequency channel selection defined for the test (i.e. Cell number as per Annex E), other frequency channels which avoid the frequency overlapping shall be selected. If no suitable selection is found the test is not applicable for the affected band.

For test cases in clauses 4, 5, 6, 7, 8, 9 the initial conditions of the downlink physical channels signal levels and downlink physical channels required are specified in Annex C.0.

Unless otherwise mentioned, in those test case where delay is the test criteria, if HARQ or even RLC retransmission happens and is detected by SS, the extra delay due to retransmission shall be excluded in the delay calculation before making a pass or fail judgement on the UE in the test.

3A.2 Requirements Classification for Statistical Testing

The test requirements are expressed as absolute requirements with a single value stating the requirement or expressed as a success rate. The statistical nature depends on the type of test requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a Device Under Test (DUT) passing the test actually meets the test requirement and determines how many times a test have to be repeated and what the pass and fail criteria is. The statistical significance shall be set according to Annex G.

3A.3 RRM Test Configurations

The cell configuration of cells described in the test cases shall be set according to TS 36.508 [7] section 4.4.7.

3A.3.1 UE with Single or Multiple Antenna Connector

For testing a UE with more than one E-UTRA antenna connector, the connection diagram configurations are described in TS 36.508 [7] Annex A for the case of 2 E-UTRA RX antennas. For UEs with more than one E-UTRA antenna connector the fading of the signals and the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in the respective test cases.

For testing a UE with a single E-UTRA antenna connector, the connection diagram configurations are not described in TS 36.508 [7] Annex A. If the E-UTRA UE supports only single RX antenna, the RX diversity connector in the diagram is not applicable.

3A.3.2 Test configuration for Inter band test cases

It is allowed to use separate AWGN generators for the different bands in interband test cases, although the connection diagrams in 36.508 Annex A display one wideband AWGN generator per DUT antenna connector. When interband test cases are also inter RAT, then it is necessary to use separated AWGN generators per RAT because of different noise density in different RATs. This is displayed accordingly in the connections in 36.508 Annex A.

3A.3.3 Test configuration for Inter RAT test cases

The DUT may employ common antennas for different RATs or separated ones, leading to different connections. The diagrams in 36.508 Annex A display only the connections with common antennas for different RATs without excluding the separate case. Note that in case of separate antennas, also separate AWGNs and faders are necessary, if applicable.

The non E-UTRA RATs are undefined with respect to the RX antenna configuration. The diagrams in 36.508 Annex A display RX diversity with 2 antennas for the non E-UTRA RATs without excluding the single antenna case. If the non E-UTRA RAT support only single RX antenna, the RX diversity connector in the diagram is not applicable.

For UEs with more than one non-E-UTRA antenna connector the fading of the signals and the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in the respective test cases.

With respect to the non E-UTRAN cell and AWGN, the diagrams in 36.508 Annex A are fully equipped, even if for certain RATs (e.g. GSM) the AWGN generator may be not applicable.

3A.3.4 UE with Multiband Capability

The Radio Resource Management performance of a UE in sections 4 – 8 is considered to be independent from all bands. Therefore, the required performance in the respective test cases can be verified in one of the bands supported by the UE, with the exception of inter-band testing requirements in clause 3A.1. The test cases in section 9 are considered to be band dependant and are therefore applicable in all of the supported bands in the UE.

3A.3.5 E-UTRAN operating band configuration

Inter-band configuration is not affecting the test purpose since the minimum requirements are valid regardless of band. Band combinations defined in table 3A.3.5-1 shall be used for testing.

For 8.20.1 and 8.20.2, there are three E-UTRA cells, Cell 1(PCell), Cell 2(neighbor cell) and Cell 3(SCell), all on different frequencies. The default cell configuration is to test on Cell1 and Cell2 on the same operating band and Cell3 on the different operating band. If the operating band of Cell 1 and Cell2 is overlapped (the operating band is less than 20MHz) and if the operating band of Cell3 has more than or equal to 20MHz, then Cell2 and Cell3 on the same band and Cell1 on the different band to test. Otherwise the test is not applicable.

Table 3A.3.5-1: Inter-band configuration

Band under test	Additional band
31	7
5,12,13,14,17, 30	4
[23]	TBD
11,18,19,21,27	1
34	41
[37]	TBD
Note 1: The band under test should contain the inter-frequency (neighbour) cell. Note 2: The additional band should contain the serving cell of the test. If more than one inter-frequency cell is needed, that cell should be on the additional band. Note 3: The bands and cells referred in this table are E-UTRAN bands and cells only.Note 4: Bands 5, 11, 23, 37 only need inter-band configuration in test cases where 3 cells are required.	

3A.3.6 CA configuration

For CA testing, unless otherwise stated, the logical carriers PCC/SCCs are mapped on physical frequencies as defined in Tables 3A.3.6-1.

Table 3A.3.6-1: PCC/SCC frequency mapping

CA Configuration	PCC-SCC mapping	Notes
Intra-band CA	CC1-CC2	1
Inter-band CA (CA_x-y)	Bx-By (if not supported by the UE, then By-Bx)	2
NOTE 1: Notation CCi-CCj means PCC on component carrier CCi and SCC on component carrier CCj, with CCi/j frequencies defined in the corresponding intra-band contiguous / non-contiguous CA band in TS 36.508. NOTE 2: Notation Bi–Bj means PCC on component Band i and SCC on component Band j, with single Band i/j frequencies defined in TS 36.508.		

3A.3.7 HD-FDD category 0 testing

For testing of category 0 HD-FDD UE in FDD operating bands, the SS shall ensure downlink transmission is only configured in downlink subframes and that UL grants are given to ensure UE is transmitting only in uplink subframes throughout the test. The subframes reserved for uplink and downlink respectively are specified in the corresponding RMC definitions in Annex A.

3A.4 Antenna Configuration

Unless otherwise specified, E-UTRA FDD or E-UTRA TDD cells in all RRM Test cases in AWGN propagation condition are configured with Antenna Configuration 1x2.

3A.4.1 Antenna connection for 4 Rx capable UEs

3A.4.1.1 Introduction

All tests in sections 4 to 9 are specified for UEs supporting either category 0 (1RX) or 2RX. In this section, the antenna connection method for applying 2RX tests to UEs supporting 4RX antenna ports is specified. No tests cases are currently specified in section 4-9 which are applicable only to 4RX antenna ports, so 4RX capable UEs are always tested by reusing tests which were originally specified for 2RX UEs.

3A.4.1.2 Principle of testing

3A.4.1.2.1 Single carrier tests

For 4RX capable UEs supporting at least one 2RX band (see note), all single carrier tests specified in section 4 to 8 shall be tested on any band where 2RX is supported with the antenna connection specified in 3A.4.1.2.3. For single carrier tests specified in section 9, all tests shall be tested with the antenna connection specified in 3A.4.1.2.3 for bands where 2RX is supported, and the antenna connection specified in 3A.4.1.2.4 for bands where 4RX is supported.

For 4RX capable UEs which do not support any 2RX band (see note), all tests specified in sections 4 to 9 shall be tested using the antenna connection specified in section 3A.4.1.2.4. For radio link monitoring tests, the SNR levels are modified according to table 3A.4.1.2.1-1 and table 3A.4.1.2.1-2.

Note: The band capability of the 4Rx UEs and corresponding test case applicability needs to be determined separately per frame structure {FDD, TDD, FS3}

Table 3A.4.1.2.1-1: Modified parameters for RLM out of sync testing with 4 RX antenna connection

Test case	SNR during T3 (dB)			
	Test 1	Test 2	Test 3	Test 4
7.3.1_1	-17	-17	-15	-15.7
7.3.3_1	-16.6	-16.7	-14.8	-15.4
7.3.5_1	-15.7	-17	N/A	N/A
7.3.7_1	-15.4	-16.6	N/A	N/A
7.3.9_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.10_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.13_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.14_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.17_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.18_1 (cell 1)	Note 1	N/A	N/A	N/A
7.3.23_1	-15.7	N/A	N/A	N/A
Note 1: For 4Rx capable UEs without any 2Rx supported RF bands,this test can be skipped. Note 2: Note 1 applies to RF bands of the same frame structure under test {FDD, TDD, FS3}				

Table 3A.4.1.2.1-2: Modified parameters for RLM in sync single carrier testing with 4 RX antenna connection

Test case	SNR during T3 (dB)		SNR during T4 (dB)	
	Test 1	Test 2	Test 1	Test 2
7.3.2_1	-14	-15.7	-9.9	-10.8
7.3.4_1	-14.8	-15.4	-9.9	-10.8
7.3.6_1	-17	N/A	-12.2	N/A
7.3.8_1	-16.6	N/A	-12.6	N/A
7.3.11_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.12_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.15_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.16_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.19_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.20_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.21_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.22_1 (cell 1)	Note 1	N/A	Note 1	N/A
7.3.24_1	-15.7	N/A	-10.8	N/A
7.3.25_1	-15.7	N/A	-10.8	N/A
Note 1: For 4Rx capable UEs without any 2Rx supported RF bands,this test can be skipped. Note 2: Note 1 applies to RF bands of the same frame structure under test {FDD, TDD, FS3}				

3A.4.1.2.2 Carrier aggregation and Dual connectivity tests

All carrier aggregation and dual connectivity tests are performed using the antenna connection in section 3A.4.1.2.3 for the PCell antenna connection if the PCell is on a band where 2RX is supported or the antenna connection in 3A.4.1.2.4 for the PCell antenna connection if the PCell is on a band where 4RX is supported.

All carrier aggregation and dual connectivity tests are performed using the antenna connection in section 3A.4.1.2.3 for the SCell or PSCell antenna connection if an SCell or PSCell is on band where 2RX is supported or the testing procedure in 3A.4.1.2.4 for the SCell or PSCell antenna connection if an SCell or PSCell is on a band where 4RX is supported.

For dual connectivity radio link monitoring tests with the PSCell on a band where 4RX is supported, the PSCell SNR levels are modified according to table 3A.4.1.2.2 -1 and table 3A.4.1.2.2 -2.

Table 3A.4.1.2.2-1: Modified parameters for dual connectivity RLM out of sync testing with 4 RX antenna connection

Test case	SNR during T3 (dB)
7.3.38_1 (cell 2)	-15.7 (5MHz) -15.7 (10MHz) -16.3 (20 MHz)
7.3.39_1 (cell 2)	-15.7 (5MHz) -15.7 (10MHz) -16.3 (20 MHz)
7.3.40_1 (cell 2)	-15.4 (5MHz) -15.4 (10MHz) -16.1 (20MHz)

Table 3A.4.1.2.2-2: Modified parameters for RLM in sync testing with 4 RX antenna connection

Test case	SNR during T3 (dB)	SNR during T4 (dB)
7.3.41_1 (cell 2)	-15.7 (5 Mhz) -17.0 (10 Mhz) -17.0 (20 Mhz)	-10.8 (5MHz) -12.2 (10MHz) -12.2 (20 MHz)
7.3.42_1 (cell 2)	-15.7 (5 Mhz) -17.0 (10 Mhz) -17.0 (20 Mhz)	-10.8 (5MHz) -12.2 (10MHz) -12.2 (20 MHz)
7.3.43_1 (cell 2)	-16.6 (5MHz) -16.6 (10 MHz) -16.6 (20 MHz)	-12.6 (5MHz) -12.6 (10 MHz) -12.6 (20 MHz)

3A.4.1.2.3 Antenna connection for bands where 2RX is supported

For bands where 2RX is supported, it is left to the UE declaration and AP configuration to decide which 2 of the 4 Rx ports are connected with data source from system simulator. The remaining 2 Rx ports shall be connected with zero input**.** No test parameters or requirements are modified.

3A.4.1.2.4 Antenna connection for bands where 4RX is supported

For bands where 4RX is supported, all 4 Rx are connected with data source from system simulator**.** The system simulator shall provide independent noise and fading (low correlation) for each antenna port. Except for the modifications to radio link monitoring thresholds described in sections 3A.4.1.2.1 and 3A.4.1.2.2, no test parameters or requirements are modified.

3A.5 Test Cases for Synchronous and Asynchronous Dual Connectivity

3A.5.1 Introduction

This clause defines a principle which is applicable to test cases verifying RRM requirements for dual connectivity (DC) operation in synchronous and asynchronous scenarios.

3A.5.2 Principle of Testing

Test cases may be defined in both synchronous DC and asynchronous DC scenarios to verify the same RRM requirement.

If test cases are defined in both synchronous and asynchronous DC scenarios to verify the same RRM requirement then the UE capable of both synchronous and asynchronous DC operations needs to be tested with one of the tests in either synchronous or asynchronous DC scenarios.

3A.6 Test cases for Carrier Aggregation under operation with Frame Structure 3 Test Cases with Different Duplex Modes

3A.6.1 Introduction

This clause defines a principle which is applicable to test cases verifying RRM requirements for carrier aggregation with at least one Scell under operation with Frame Structure 3.

3A.6.2 Principle of testing

In Annex A, tests for carrier aggregation with at least one Scell under operation with frame structure 3are specified with both an FDD and a TDD Pell to verify the same RRM requirement. If both types of tests are relevant to a UE considering supported CA bands, the test coverage can be considered fulfilled by executing either the tests with FDD PCell or the tests with TDD PCell and the UE is not required to pass both tests.

3A.7 Test case selection criteria for RRM Carrier Aggregation

3A.7.1 Introduction

This clause defines a test selection principle which is applicable to all test cases verifying RRM requirements for carrier aggregation.

3A.7.2 Principle of testing

For all RRM CA requirements, the UE shall be tested using the highest number of supported CCs. The test coverage obtained on a given CA band combination shall be applied to any other CA band combination that is a subset of the one tested. Therefore, subset CA band combinations shall not be tested.

For example, if a UE supports at maximum 5 CC, then RRM CA test requirements shall only be tested using 5CCs. If the selected CA band combination to be used is 1A-3C-7C, then the test coverage obtained on a given RRM CA test requirement shall also be applied to any subset of it (for example 1A-3C or 1A-7C).

4 E-UTRAN RRC_IDLE State Mobility

After the UE has switched on and a PLMN has been selected, the cell selection process takes place. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

When the UE is in either Camped Normally state or Camped on Any Cell state on a cell, the UE attempts to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated by the serving cell, the cell re-selection evaluation process takes place. This process allows the UE to select a more suitable cell and camp on it. In this process the UE measurement activity is controlled by measurement rules defined in TS 36.304 [6] clause 5.2.4.2, allowing the UE to limit its measurement activity.

4.1 E-UTRAN Cell Selection

Editor's note: There are currently no tests defined for E-UTRAN cell selection.

4.2 E-UTRAN Cell Re-Selection

4.2.1 E-UTRAN FDD - FDD cell re-selection intra frequency case

4.2.1.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

4.2.1.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate\ E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,\ EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurement of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra} / 2$.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluateFDD,Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for re-selection, the side conditions are RSRP and SCh apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of Treselection is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the Treselection timer.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI\text{-}EUTRA}$ + 50 ms. $T_{SI\text{-}EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Intra-frequency carrier

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.1.

4.2.1.4 Test description

4.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.1.4.3

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.1.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.1.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.1.5 Test requirement

Tables 4.2.1.4.1-1 and 4.2.1.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency cell re-selection test case.

Table 4.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
$\hat{E}_s / I_{ot}$	dB	16.00	-3.55	3.24	-infinity	3.24	-3.55
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16.00	13.00	16.45	-infinity	16.45	13.00
RSRP Note 3	dBm/15 kHz	-82.00	-85.00	-81.55	-infinity	-81.55	-85.00
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{detect,E\text{-}UTRAN\_Intra}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Intra}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI-EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.2 E-UTRAN TDD - TDD cell re-selection intra frequency case

4.2.2.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

4.2.2.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluate,E-UTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.2.

4.2.2.4 Test description

4.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.2.4.1-1: General Test Parameters for E-UTRAN TDD-TDD intra cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier. In the test there are three successive time periods, with time duration of T1, T2, and T3

respectively. Only Cell 1 is already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure "UE responds" means "UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2"

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.2.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2, during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event "Re-select newly detected Cell 2". Otherwise count a fail for the event "Re-select newly detected Cell 2".

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.2.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1, during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event "Re-select already detected Cell 1". Otherwise count a fail for the event "Re-select already detected Cell 1".

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events "Re-select newly detected Cell 2" and "Re-select already detected Cell 1" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.2.2.5 Test requirement

Tables 4.2.2.4.1-1, and 4.2.2.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency cell re-selection test case.

Table 4.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD intra frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
$\hat{E}_s / I_{ot}$	dB	16.00	-3.55	3.24	-infinity	3.24	-3.55
N_{oc}	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16.00	13.00	16.45	-infinity	16.45	13.00
RSRP	dBm/15 kHz	-82.00	-85.00	-81.55	-infinity	-81.55	-85.00
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,EUTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{detect,EUTRAN\_Intra}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Intra}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.3 E-UTRAN FDD - FDD cell re-selection inter frequency case

4.2.3.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

4.2.3.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority E-UTRA carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable lower or equal priority inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateFDD,\ Inter}$ + $Treselection_{EUTRAN}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ DRX cycle as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}$ / 2.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS 36.304 [6] within $K_{carrier}$ * $T_{evaluate,E-UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities. When evaluating cells for re-selection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $Treselection_{EUTRAN}$ is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $Treselection_{EUTRAN}$ timer.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells) , cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.3.

4.2.3.4 Test description

4.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.3.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one of the E-UTRA FDD carriers. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to duration T0 in Table 4.2.3.5-1

3. Set the parameters according to duration T1 in Table 4.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

4. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.

5. If the UE responds on lower priority cell, Cell 1 during time duration T1 within 8 seconds from the beginning of time period T1, then count a success for the event “Re-select lower priority Cell 1”. Otherwise count a fail for the event “Re-select lower priority Cell 1”.

6. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 7. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 12.

7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.3.5-2. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) shall be changed to ensure Cell 2 is not detected by the UE.

8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.3.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 2.

10. If the UE responds on higher priority cell, Cell 2 during time duration T3 within 68 seconds from the beginning of time period T3, then count a success for the event “Re-select higher priority Cell 2”. Otherwise count a fail for the event “Re-select higher priority Cell 2”.

11. If the UE has re-selected Cell 2 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 2, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 2.
    Set the parameters according to duration T0 in Table 4.2.3.5-1.

13. Repeat step 3-12 until a test verdict has been achieved.
    Each of the events “Re-select lower priority Cell 1” and “Re-select higher priority Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.3.5 Test requirement

Tables 4.2.3.4.1-1, 4.2.3.5-1 and 4.2.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency cell re-selection test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s / I_{ot}$	dB	-3.70	14.40
$\hat{E}_s / N_{oc}$	dB	-3.70	14.40
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.3.5-2: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.35					
RSRP Note 3	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s / I_{ot}$	dB	6.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s / N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	S	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.4 E-UTRAN FDD - TDD cell re-selection inter frequency case

4.2.4.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and mode, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.4.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward.

4.2.4.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2.

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell. An inter-frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex I.1.2 for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,E\text{-}UTRAN\_Inter}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP or RSRQ at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ (see table 4.2.4.3-1) for identified lower or equal priority inter-frequency cells. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}/2$.

The UE shall not consider a E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 [6] within $K_{carrier} * T_{evaluate,E-UTRAN\_Inter}$ when $T_{reselection} = 0$ as specified in table 4.2.4.3-1 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

Table 4.2.4.3-1 : $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,E-UTRAN\_Inter}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{evaluate,E-UTRAN\_Inter}$ [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

For higher priority cells, a UE may optionally use a shorter value for $T_{measureE-UTRA\_Inter}$, which shall not be less than Max(0.64 s, one DRX cycle).

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.4.

4.2.4.4 Test description

4.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.4.4.3.
5. There are two E-UTRA carriers and two cells specified in the test. One E-UTRA FDD Cell 1 is the neighbour cell on the FDD carrier frequency, One E-UTRA TDD Cell 2 is the cell on the TDD carrier frequency and is used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.4.4.1-1: General Test Parameters for E-UTRAN FDD-TDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
Cell 1 E-UTRA RF Channel Number			1	One FDD carrier frequency is used. And Cell 1 is on RF channel number 1.
Cell 2 E-UTRA RF Channel Number			2	One TDD carrier frequencies is used. And Cell 2 is on RF channel number 2.
Time offset between cells			3 ms	Asynchronous cells
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA TDD PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
E-UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
E-UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.4.4.2 Test procedure

The test scenario comprises of 1 E-UTRA FDD Cell 1 and 1 E-UTRA TDD Cell 2. The UE is requested to monitor the neighbouring cell on the E-UTRA TDD carriers. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.2.4.5-1
3. Set the parameters according to duration T1 in Table 4.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.
5. If the UE responds on lower priority cell, Cell 1 during time duration T1 within 8 seconds from the beginning of time period T1, then count a success for the event “Re-select lower priority Cell 1”. Otherwise count a fail for the event “Re-select lower priority Cell 1”.

6. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 7. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 12.

7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.4.5-2. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) shall be changed to ensure Cell 2 is not detected by the UE.

8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.4.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 2.

10. If the UE responds on higher priority cell, Cell 2 during time duration T3 within 68 seconds from the beginning of time period T3, then count a success for the event “Re-select higher priority Cell 2”. Otherwise count a fail for the event “Re-select higher priority Cell 2”.

11. If the UE has re-selected Cell 2 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 2, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 2.
    Set the parameters according to duration T0 in Table 4.2.4.5-1.

13. Repeat step 3-12 until a test verdict has been achieved.
    Each of the events “Re-select lower priority Cell 1” and “Re-select higher priority Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.4.4.3-1: Common Exception messages for E-UTRAN FDD-TDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.3.2-2

4.2.4.5 Test requirement

Tables 4.2.4.4.1-1, 4.2.4.5-1 and 4.2.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-TDD inter-frequency cell re-selection test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-TDD inter frequency cell re-selection test case in AWGN

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 FDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s / I_{ot}$	dB	-3.70	14.4
$\hat{E}_s / N_{oc}$	dB	-3.70	14.4
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.4.5-2: Cell Specific Test requirement Parameters for E-UTRAN FDD-TDD inter frequency cell re-selection test case in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 FDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.35					
RSRP Note 3	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s / I_{ot}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s / N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.5 E-UTRAN TDD - FDD cell re-selection inter frequency case

4.2.5.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and mode, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.5.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward.

4.2.5.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2.

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell. An inter-frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex I.1.2 for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,E\text{-}UTRAN\_Inter}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP or RSRQ at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ (see table 4.2.5.3-1) for identified lower or equal priority inter-frequency cells. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated

as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}/2$.

The UE shall not consider a E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 [6] within $K_{carrier} * T_{evaluate,E-UTRAN\_Inter}$ when $T_{reselection} = 0$ as specified in table 4.2.5.3-1 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

Table 4.2.5.3-1 : $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,E-UTRAN\_Inter}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{evaluate,E-UTRAN\_Inter}$ [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

For higher priority cells, a UE may optionally use a shorter value for $T_{measureE-UTRA\_Inter}$, which shall not be less than Max(0.64 s, one DRX cycle).

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.5.

4.2.5.4 Test description

4.2.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.5.4.3.

5. There are two E-UTRA carriers and two cells specified in the test. One E-UTRA TDD Cell 1 is the neighbour cell on the TDD carrier frequency, One E-UTRA FDD Cell 2 is the cell on the FDD carrier frequency and is used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.5.4.1-1: General Test Parameters for E-UTRAN TDD-FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
Cell 1 E-UTRA RF Channel Number			1	One TDD carrier frequency is used. And Cell 1 is on RF channel number 1.
Cell 2 E-UTRA RF Channel Number			2	One FDD carrier frequencies is used. And Cell 2 is on RF channel number 2.
Time offset between cells			3 ms	Asynchronous cells
E-UTRA TDD PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
E-UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.5.4.2 Test procedure

The test scenario comprises of 1 E-UTRA TDD Cell 1 and 1 E-UTRA FDD Cell 2. The UE is requested to monitor the neighbouring cell on the E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.2.5.5-1.
3. Set the parameters according to duration T1 in Table 4.2.5.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.
5. If the UE responds on lower priority cell, Cell 1 during time duration T1 within 8 seconds from the beginning of time period T1, then count a success for the event “Re-select lower priority Cell 1”. Otherwise count a fail for the event “Re-select lower priority Cell 1”.

6. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 7. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 12.

7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.5.5-2. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) shall be changed to ensure Cell 2 is not detected by the UE.

8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.5.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 2.

10. If the UE responds on higher priority cell, Cell 2 during time duration T3 within 68 seconds from the beginning of time period T3, then count a success for the event “Re-select higher priority Cell 2”. Otherwise count a fail for the event “Re-select higher priority Cell 2”.

11. If the UE has re-selected Cell 2 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 2, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 2.
    Set the parameters according to duration T0 in Table 4.2.5.5-1.

13. Repeat step 3-12 until a test verdict has been achieved.
    Each of the events “Re-select lower priority Cell 1” and “Re-select higher priority Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.5.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.3.2-2

4.2.5.5 Test requirement

Tables 4.2.5.4.1-1, 4.2.5.5-1 and 4.2.5.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter-frequency cell re-selection test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 FDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s / I_{ot}$	dB	-3.70	14.40
$\hat{E}_s / N_{oc}$	dB	-3.70	14.40
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.5.5-2: Cell Specific Test requirement Parameters for E-UTRAN TDD-FDD inter frequency cell re-selection test case in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.35					
RSRP Note 3	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s / I_{ot}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s / N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E-UTRAN\_Inter} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.6 E-UTRAN TDD - TDD cell re-selection inter frequency case

4.2.6.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

4.2.6.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2 of TS 36.133 [4].

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for a lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable lower or equal priority inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for reselections based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If, after it is found in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell

whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter} / 2$.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS 36.304 [6] within $K_{carrier} * T_{evaluate,E-UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN} = 0$ provides that the re-selection criteria is met by a margin of at least 5dB for re-selection based on ranking or 6dB for re-selection based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.6.

4.2.6.4 Test description

4.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.6.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to clause C.0 and C.1for this test.

Table 4.2.6.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier. In the test there are three successive time periods, with time duration of T1, T2, and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.2.6.5-1
3. Set the parameters according to duration T1 in Table 4.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.
5. If the UE responds on the lower priority cell, Cell 1, during time duration T1 within 8 seconds from the beginning of time period T1, then count a success for the event “Re-select lower priority Cell 1”. Otherwise count a fail for the event “Re-select lower priority Cell 1”.
6. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 7. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 12.
7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.6.5-2. During time duration T2, Cell 2 shall be powered OFF and change Cell 2 physical cell identity to ((current cell 2 physical cell identity + 1) mod 14 + 2) to ensure Cell 2 is not detected by the UE.
8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.6.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

10. If the UE responds on higher priority cell, Cell 2, during time duration T3 within 68 seconds from the beginning of time period T3, then count a success for the event “Re-select higher priority Cell 2”. Otherwise count a fail for the event “Re-select higher priority Cell 2”.

11. If the UE has re-selected Cell 2 within T3, after the re-selection or when T3 expires, skip to step 13.
Otherwise, if T3 expires and the UE has not yet re-selected Cell 2, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 2.
Set the parameters according to duration T0 in Table 4.2.6.5-1.

13. Repeat step 3-12 until a test verdict has been achieved.
Each of the events “Re-select lower priority Cell 1” and “Re-select higher priority Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

4.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.4.3.3 and 4.6.3 with the following exceptions:

Table 4.2.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.2.6.5 Test requirement

Tables 4.2.6.4.1-1, 4.2.6.5-1 and 4.2.6.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency cell re-selection test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s / I_{ot}$	dB	-3.70	14.40
$\hat{E}_s / N_{oc}$	dB	-3.70	14.40
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 4.2.6.5-2: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

Qrxlevmin	dBm	-140			-140		
N_{oc}	dBm/15 kHz	-99.35					
RSRP	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s / I_{ot}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s / N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	S	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.7 E-UTRAN FDD – FDD Inter frequency case in the existence of non-allowed CSG cell

4.2.7.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and there is the interference from non-allowed CSG cell and the layers have equal priority, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.7.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD release 9 and forward.

4.2.7.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority E-UTRA carrier frequencies.

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateFDD,\ Inter}$ + $Treselection_{EUTRAN}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRQ at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ DRX cycle as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}$ / 2.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS 36.304 [6] within $K_{carrier}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

When evaluating cells for re-selection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $Treselection_{EUTRAN}$ is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $Treselection_{EUTRAN}$ timer.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells) , cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.7.

4.2.7.4 Test description

4.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

The UE's allowed CSG list is empty.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.27 for UE with 2Rx RF band and Annex A, Figure A.27a for 4Rx capable UE without any 2Rx RF bands. If the Band Under Test requires the usage of an auxiliary band and this one is 2Rx, please connect only the first 2 Rx antenna ports in the SS for the auxiliary band.

2. The general test parameter settings are set up according to Table 4.2.7.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.7.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test and one non-allowed E-UTRA FDD CSG cell. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test and Cell 3 is the cell used for adding interference from non-allowed CSG cell.

Table 4.2.7.4.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
Time offset between cells		ms	3	Asynchronous cells
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that the non-allowed CSG cell is identified.
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that whether cell re-selection would not occur is insured.

4.2.7.4.2 Test procedure

The test consists of one active cell, one neighbour cell and one non-allowed CSG cell. The UE is requested to monitor the neighbouring cell on one of the E-UTRA FDD carriers. In the test there are four successive time periods, with time duration of T0, T1, T2 and T3 respectively. Cell 1 is already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to duration T0 in Table 4.2.7.5-1. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.

3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 12.

5. Set the parameters according to duration T1 in Table 4.2.7.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

6. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.7.5-2. T2 starts.

8. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

9. If the UE has responded on the newly detected Cell 2 during time duration within 34 seconds from the beginning of time period T2 count a success for the event “Re-select newly detected Cell 2”, and after the re-selection, continue with step 10.
   Otherwise, if the UE has not re-selected Cell 2 count a fail for the event “Re-select newly detected Cell 2”, and skip to step 12.

10. After the re-selection or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.7.5-2. T3 starts.

11. If the UE has not re-selected Cell 1 when T3 expires, count a success for the event “Hold out on Cell 2”, and skip to step 13. Otherwise, if the UE responds on the known cell, Cell 1 during time duration T3, count a fail for the event “Hold out on Cell 2”, and continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Hold out on Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.7.4.3-1: Common Exception messages for E-UTRAN FDD – FDD Inter frequency case in the existence of non-allowed CSG cell

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.2.7.4.3-2: *SystemInformationBlockType1*: E-UTRAN inter frequency cell re-selection case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellAccessRelatedInfo SEQUENCE {			
csg-Indication	TRUE	Cell 3	
csg-Identity	Physical Cell ID of the Cell 3	Cell 3	
}			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
cellSelectionInfo-v920 SEQUENCE {			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
q-QualMinOffset-r9	Not present		
}			
}			
}			
}			

Table 4.2.7.4.3-3: *SystemInformationBlockType3*: E-UTRAN inter frequency cell re-selection case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
intraFreqCellReselectionInfo SEQUENCE {			
lateNonCriticalExtension {			
s-IntraSearch-v920 SEQUENCE {}	Not present		
s-NonIntraSearch-v920 SEQUENCE {			
s-NonIntraSearchP-r9	25	Cell 1	
s-NonIntraSearchQ-r9	10	Cell 1	
}			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
threshServingLowQ-r9	Not present		
}			
}			

Table 4.2.7.4.3-4: *SystemInformationBlockType4*: E-UTRAN inter frequency cell re-selection case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType4 ::= SEQUENCE {			
intraFreqNeighCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
physCellId	Physical Cell ID of the Cell 3	Cell 1	
	Physical Cell ID of the Cell 1	Cell 3	
}			
csg-PhysCellIdRange SEQUENCE {			
start	Physical Cell ID of the cell on which this SIB is transmitted	Cell 3	
range	Not present		
}			
}			

Table 4.2.7.4.3-5: *SystemInformationBlockType5*: E-UTRAN inter frequency cell re-selection case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
dl-CarrierFreq	Frequency of the Cell 2	Cell 1, 3	
	Frequency of the Cell 1	Cell 2	
q-RxLevMin	-70 (-140 dBm)	Cell 1, 2, 3	
interFreqNeighCellList[*n*] SEQUENCE (SIZE (1..maxCellInter)) OF SEQUENCE {		Cell 2	
physCellId	Physical Cell ID of the Cell 1		
q-OffsetCell	dB0		
}			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
threshX-Q-r9 SEQUENCE {}	Not present		
}			
}			

Table 4.2.7.4.3-6: *SystemInformationBlockType9*: E-UTRAN inter frequency cell re-selection case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-8 SystemInformationBlockType9			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType9 ::= SEQUENCE {			
hnb-Name	"3gppTest"	Cell 3	
}			

4.2.7.5 Test requirement

Tables 4.2.7.4.1-1, 4.2.7.5-1 and 4.2.7.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Inter frequency case in the existence of non-allowed CSG cell test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.7.5-1: Cell specific Test requirement parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1	Cell 2	Cell 3
		T0		
E-UTRA RF Channel number		1	2	1
$BW_{channel}$	MHz	10	10	10
OCNG Patterns defined in D.1.2		OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qrxlevmin	dBm	-140	-140	-140
Qqualmin	dB	-20	-20	-20
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-85.00	-101.00	-Infinity
RSRQ Note 3	dB	-11.00	-15.56	-Infinity
$\hat{E}_s / I_{ot}$	dB	13.00	-3.00	-Infinity
$\hat{E}_s / N_{oc}$	dB	13.00	-3.00	-Infinity
Treselection	s	0	0	0
SnonintrasearchQ	dB	10	Not sent	Not sent
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and RSRQ and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.7.5-2: Cell specific test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1			Cell 2			Cell 3(Non-allowed CSG cell)		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			1		
$BW_{channel}$	MHz	10			10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
Qrxlevmin	dBm	-140			-140			-140		
Qqualmin	dB	-20								
N_{oc} Note 2	dBm/15 kHz	-98								
RSRP Note 3	dBm/15 kHz	-90.20	-90.0	-85.00	-Infinity	-85.00	-90.00	-90.00	-85.00	-60.00
RSRQ Note 3	dB	-14.24	-17.15	-35.81	-Infinity	-11.00	-11.43	-14.04	-12.15	-10.81
$\hat{E}_s / I_{ot}$	dB	-0.84	-5.21	-25.00	-Infinity	13.00	8.00	-0.47	4.36	24.79
$\hat{E}_s / N_{oc}$	dB	7.80	8.00	13.00	-Infinity	13.00	8.00	8.00	13.00	38.00
Treselection	s	0			0			0		
SnonintrasearchQ	dB	10			Not sent			Not sent		
Propagation Condition		AWGN								

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{evaluate, E-UTRAN\_Inter} + T_{SI-EUTRA}$

$T_{evaluate, E-UTRAN\_Inter}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.4.

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4.

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 s, but the test allows 34 seconds.)

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be at least 90%.

The probability of re-selection from Cell 2 to Cell 1 during T3 observed during testing shall be less than 10%.

For the test to pass, both events above shall pass with a confidence level of 95%.

4.2.8 E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

4.2.8.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and there is the interference from non-allowed CSG cell and the layers have equal priority, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.8.2 Test applicability

This test applies to all types of E-UTRA UE supporting TDD release 9 and forward.

4.2.8.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E-UTRAN\_Inter} + T_{SI-EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2 of TS 36.133 [4].

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for a lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier} * T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If, after it is found in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRQ at least every $K_{carrier} * T_{measure,EUTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter} / 2$.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS 36.304 [6] within $K_{carrier} * T_{evaluate,E-UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN} = 0$ provides that the re-selection criteria is met by a margin of at least 5dB for re-selection based on ranking or 6dB for re-selection based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.8.

4.2.8.4 Test description

4.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

The UE's allowed CSG list is empty.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.27 for UE with 2Rx RF band and Annex A, Figure A.27a for 4Rx capable UE without any 2Rx RF bands. If the Band Under Test requires the usage of an auxiliary band and this one is 2Rx, please connect only the first 2 Rx antenna ports in the SS for the auxiliary band.

2. The general test parameter settings are set up according to Table 4.2.8.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.8.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test and one non-allowed E-UTRA TDD CSG cell. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test and Cell 3 is the cell used for adding interference from non-allowed CSG cell.

Table 4.2.8.4.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Time offset between cells		µs	3	Synchronous cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that the non-allowed CSG cell is identified.
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that whether cell re-selection would not occur is insured.

4.2.8.4.2 Test procedure

The test consists of one active cell, one neighbour cell and one now-allowed CSG cell. The UE is requested to monitor the neighbouring cell on one of the E-UTRA TDD carriers. In the test there are four successive time periods, with time duration of T0, T1, T2 and T3 respectively. Cell 1is already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to duration T0 in Table 4.2.8.5-1. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.

3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 12.

5. Set the parameters according to duration T1 in Table 4.2.8.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

6. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.8.5-2. T2 starts.

8. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

9. If the UE has responded on the newly detected Cell 2 during time duration within 34 seconds from the beginning of time period T2 count a success for the event “Re-select newly detected Cell 2”, and after the re-selection, continue with step 10.
   Otherwise, if the UE has not re-selected Cell 2 count a fail for the event “Re-select newly detected Cell 2”, and skip to step 12.

10. After the re-selection or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.8.5-2. T3 starts.

11. If the UE has not re-selected Cell 1 when T3 expires, count a success for the event “Hold out on Cell 2”, and skip to step 13. Otherwise, if the UE responds on the known cell, Cell 1 during time duration T3, count a fail for the event “Hold out on Cell 2”, and continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Hold out on Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.8.4.3-1: Common Exception messages for E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.2.8.4.3-2: *SystemInformationBlockType1*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellAccessRelatedInfo SEQUENCE {			
csg-Indication	TRUE	Cell 3	
csg-Identity	Physical Cell ID of the Cell 3	Cell 3	
}			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
cellSelectionInfo-v920 SEQUENCE {			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
q-QualMinOffset-r9	Not present		
}			
}			
}			
}			

Table 4.2.8.4.3-3: *SystemInformationBlockType3*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
intraFreqCellReselectionInfo SEQUENCE {			
lateNonCriticalExtension {			
s-IntraSearch-v920 SEQUENCE {}	Not present		
s-NonIntraSearch-v920 SEQUENCE {			
s-NonIntraSearchP-r9	25	Cell 1	
s-NonIntraSearchQ-r9	10	Cell 1	
}			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
threshServingLowQ-r9	Not present		
}			
}			

Table 4.2.8.4.3-4: *SystemInformationBlockType4*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType4 ::= SEQUENCE {			
intraFreqNeighCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
physCellId	Physical Cell ID of the Cell 3	Cell 1	
	Physical Cell ID of the Cell 1	Cell 3	
}			
csg-PhysCellIdRange SEQUENCE {			
start	Physical Cell ID of the cell on which this SIB is transmitted	Cell 3	
range	Not present		
}			
}			

Table 4.2.8.4.3-5: *SystemInformationBlockType5*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
dl-CarrierFreq	Frequency of the Cell 2	Cell 1, 3	
	Frequency of the Cell 1	Cell 2	
q-RxLevMin	-70 (-140 dBm)	Cell 1, 2, 3	
interFreqNeighCellList[*n*] SEQUENCE (SIZE (1..maxCellInter)) OF SEQUENCE {		Cell 2	
physCellId	Physical Cell ID of the Cell 1		
q-OffsetCell	dB0		
}			
q-QualMin-r9	-20 (-20dB)	Cell 1, 2, 3	
threshX-Q-r9 SEQUENCE {}	Not present		
}			
}			

Table 4.2.8.4.3-6: *SystemInformationBlockType9*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-8 SystemInformationBlockType9			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType9 ::= SEQUENCE {			
hnb-Name	"3gppTest"	Cell 3	
}			

4.2.8.5 Test requirement

Tables 4.2.8.4.1-1, 4.2.8.5-1 and 4.2.8.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.8.5-1: Cell specific Test requirement parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1	Cell 2	Cell 3
		T0		
E-UTRA RF Channel number		1	2	1
$BW_{channel}$	MHz	10	10	10
OCNG Patterns defined in D.2.2		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qrxlevmin	dBm	-140	-140	-140
Qqualmin	dB	-20	-20	-20
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-85.00	-101.00	-Infinity
RSRQ Note 3	dB	-11.00	-15.56	-Infinity
$\hat{E}_s / I_{ot}$	dB	13.00	-3.00	-Infinity
$\hat{E}_s / N_{oc}$	dB	13.00	-3.00	-Infinity
Treselection	s	0	0	0
SnonintrasearchQ	dB	10	Not sent	Not sent
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and RSRQ and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.8.5-2: Cell specific test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1			Cell 2			Cell 3 (Non-allowed CSG cell)		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			1		
$BW_{channel}$	MHz	10			10			10		
OCNG Pattern defined in D..2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
Qrxlevmin	dBm	-140			-140			-140		
Qqualmin	dB	-20								
N_{oc} Note 2	dBm/ 15kHz	-98								
RSRP Note 3	dBm/ 15kHz	-90.20	-90.00	-85.00	-Infinity	-85.00	-90.00	-90.00	-85.00	-60.00
RSRQ Note 3	dB	-14.24	-17.15	-35.81	-Infinity	-11.00	-11.43	-14.04	-12.15	-10.81
$\hat{E}_s / I_{ot}$	dB	-0.84	-5.21	-25.00	-Infinity	13.00	8.00	-0.47	4.36	24.79
$\hat{E}_s / N_{oc}$	dB	7.80	8.00	13.00	-Infinity	13.00	8.00	8.00	13.00	38.00
Treselection	S	0			0			0		
SnonintrasearchQ	dB	10			Not sent			Not sent		
Propagation Condition		AWGN								

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{evaluate,\ E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.4.

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4.

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 s, but the test allows 34 seconds.)

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be at least 90%.

The probability of re-selection from Cell 2 to Cell 1 during T3 observed during testing shall be less than 10%.

For the test to pass, both events above shall pass with a confidence level of 95%.

4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth

4.2.9.1 Test purpose

Same test purpose as in clause 4.2.1.1.

4.2.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 8 and forward and only support E-UTRA bands within band group FDD_N.

4.2.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.1.3 with the following exceptions:

- Instead of A.4.2.1 → use A.4.2.9.

4.2.9.4 Test description

4.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 4.2.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra cell re-selection test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 4.2.1.4.1-1 for the other parameters. Note 2: This is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

4.2.9.4.2 Test procedure

Same test procedure as in clause 4.2.1.4.2 with the following exceptions:

- Instead of Table 4.2.1.5-1 → use Table 4.2.9.5-1.

4.2.9.4.3 Message contents

Same message contents as in clause 4.2.1.4.3.

4.2.9.5 Test requirement

Same test requirement as in clause 4.2.1.5 with the following exceptions:

Tables 4.2.9.4.1-1 and 4.2.9.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency cell re-selection test case.

Table 4.2.9.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN for 5MHz

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.16 (OP.16 FDD)		OP.16 FDD			OP.16 FDD		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 4.2.1.5-1 for the other parameters.							

4.2.10 E-UTRAN FDD – FDD reselection using an increased number of carriers

4.2.10.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements using an increased number of carriers.

4.2.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports increased number of carrier monitoring.

4.2.10.3 Minimum conformance requirements

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in clause 4.2.2.

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

UE shall be able to evaluate whether a newly detectable inter-frequency cell in normal performance group meets the reselection criteria defined in TS36.304 within $K_{carrier,normal} * T_{detect,EUTRAN\_Inter}$, and able to evaluate whether a newly detectable inter-frequency cell in reduced performance group meets the reselection criteria defined in TS36.304 within $6 * K_{carrier,reduced} * T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall be able to evaluate whether a newly detectable inter-frequency cell in normal performance group meets the reselection criteria defined in TS36.304 within $K_{carrier,normal} * T_{detect,EUTRAN\_Inter}$, and when Srxlev < 3 dB or Squal < 3 dB and able to evaluate

whether a newly detectable inter-frequency cell in reduced performance group meets the reselection criteria defined in TS36.304 within 6 * $K_{carrier,reduced}$ * $T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. An inter-frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex B.1.2 for a corresponding Band.

UE shall measure RSRP or RSRQ at least every $K_{carrier,normal}$ * $T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in normal performance group, and at least every 6 * $K_{carrier,reduced}$ * $T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in reduced performance group. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall measure RSRP or RSRQ at least every $K_{carrier,normal}$ * $T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every 6 * $K_{carrier,reduced}$ * $T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in reduced performance group. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}$/2.

The UE shall not consider a E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

, for an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell in normal performance group has met reselection criterion defined TS 36.304 within $K_{carrier,normal}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, and capable of evaluating that the inter-frequency cell in reduced performance group has met reselection criterion defined TS 36.304 within 6 * $K_{carrier,reduced}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell in normal performance group has met reselection criterion defined TS 36.304 within $K_{carrier,normal}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, and when Srxlev < 3 dB or Squal < 3 dB capable of evaluating that the inter-frequency cell in reduced performance group has met reselection criterion defined TS 36.304 within 6 * $K_{carrier,reduced}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter}$ are specified in Table 4.2.10.3-1. For UE configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter}$ are specified in Table 4.2.10.3-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter}$ when multiple PTWs are used.

Table 4.2.10.3-1 : $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,E\text{-}UTRAN\_Inter}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_Inter}$ [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

Table 4.2.10.3-2: $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 1.28s periods)	$T_{detect,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_inter}$ [s] (number of DRX cycles)
5.12 ≤ eDRX_IDLE cycle length ≤ 2621.44	0.32	≥1.28 (1)	$eDRX\_cycle\_length \times \left\lceil \frac{23}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$ (23)	0.32 (1)	0.64 (2)
	0.64	≥1.28 (1)		0.64 (1)	1.28 (2)
	1.28	≥2.56 (2)		1.28 (1)	2.56 (2)
	2.56	≥5.12 (4)		2.56 (1)	5.12 (2)
NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs. NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].					

UE which support Increased UE carrier monitoring E-UTRA according to the capabilities in [5,14] shall be capable of monitoring at least

- Depending on UE capability, 8 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 8 TDD E-UTRA inter-frequency carriers

UE which support increased UE carrier monitoring UTRA according to the capabilities in [5,14] shall additionally be capable of monitoring at least

- Depending on UE capability, 6 FDD UTRA carriers, and
- Depending on UE capability, 7 TDD UTRA carriers, and

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC_IDLE state and supporting Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [2,31] shall be capable of monitoring a total of at least 13 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

In addition to the requirements defined above, the UE which indicates support for Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [5,14], and also supports standalone NR, shall be capable of monitoring a total of at least [15] carrier frequency layers comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 carriers), cdma2000 1x, HRPD and NR layers.

The requirements in this section apply for UE regardless of their capability to support eDRX_IDLE.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4, 4.2.2.9a and A.4.2.10.

4.2.10.4 Test description

4.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure TBD (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.2.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.10.4.3.

5. There are eight E-UTRA FDD inter-frequency cells on 8 different carriers in the neighbour list of cell 1which is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.10.4.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2, 3, 4 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3, cell 4	
T2 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T2
	Neighbour cell		Cell 1, cell 2, cell 4	
T3 end condition	Active cell		Cell 4	UE shall perform reselection to cell 4 during T3
	Neighbour cell		Cell 1, cell 2, cell 3	
T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell 2, cell 3, cell 4	
UE configured E-UTRA RF Channel Number			1, 2,3,4,5,6,7,8,9	Serving cell and eight xDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration			Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [16]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(Test equipment frequency selection and configuration time) + 960	T0 is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		s	25	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	200	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	200	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

4.2.10.4.2 Test procedure

The test consists of 8 E-UTRA FDD interfrequency cells on 8 different carriers in the neighbour list of cell 1(serving cell). Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 and selects frequencies for cells 2, 3 and 4 which are chosen from the 8 intefrequency layers which are configured

in the UE neighbour cell. The neighbour lists of cells 2, 3 and 4 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test. Cell 1, 2, 3 and 4 are identified by the UE during time phase T0. Cell 1, cell 2, cell 3 and cell 4 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2, 3 or 4. Cells 1, 2, 3 and 4 all have equal absolute priority.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2, Cell 3 and Cell 4 physical cell identities = initial Cell 2, Cell 3 and Cell 4 physical cell identities.

2. Set the parameters according to T0 in Table 4.2.10.5-1. Propagation conditions are set according to Annex B clause B.1.1. T0 starts.

3. Set Cell 2, 3 and 4 physical cell identities = ((current cell 2, 3 and 4 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T0 expires, the SS shall switch the power setting from T0 to T1 as specified in Table 4.2.10.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T1 within 20.5 seconds from the beginning of time period T1, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, continue with step 8. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, skip to step 20.

8. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.10.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 3.

10. If the UE responds on the newly detectable cell, Cell 3 during time duration T2 within 193.3 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 3”. Otherwise count a fail for the event “Re-select newly detected Cell 3”.

11. If the UE has re-selected Cell 3 within T2, after the re-selection or when T2 expires, continue with step 12. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 20.

12. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.10.5-1.

13. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 4.

14. If the UE responds on the newly detectable cell, Cell 4 during time duration T3 within 193.3 seconds from the beginning of time period T3, then count a success for the event “Re-select newly detected Cell 4”. Otherwise count a fail for the event “Re-select newly detected Cell 4”.

15. If the UE has re-selected Cell 4 within T3, after the re-selection or when T3 expires, continue with step 16. Otherwise, if T3 expires and the UE has not yet re-selected Cell 4, skip to step 20.

16. The SS shall switch the power setting from T3 to T4 as specified in Table 4.2.10.5-1.

17. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

18. If the UE responds on the already detected cell, Cell 1 during time duration T4 within 20.5 seconds from the beginning of time period T4, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

19. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 13. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 20.

20. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

21. Repeat step 2-20 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell” and “Re-select already detected Cell” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict. If both events pass, the test passes. If one event fails, the test fails.

4.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.10.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.2.10.4.3-2: *SystemInformationBlockType5*: E-UTRAN inter frequency cell re-selection for IncMon

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
InterFreqCarrierFreqListExt-r12[n] SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin-r12	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
reducedMeasPerformance-r12	TRUE for cell 3 and 4	If neighbouring inter-frequency cell is configured for reduced measurement performance	
}			

Table 4.2.10.4.3-3: *SystemInformationBlockType3*: E-UTRAN inter frequency cell re-selection for IncMon

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	62		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)		
t-ReselectionEUTRA	0		
}			

4.2.10.5 Test requirement

Tables 4.2.10.4.1-1 and 4.2.10.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency cell re-selection using an increased number of carriers test case.

Table 4.2.10.5-1: Cell specific test parameters for FDD-FDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	Cell 1					Cell 2					Cell 3			
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2	T
E-UTRA RF Channel number		1					Randomly selected from 2,3,4 such that cell 2 is in the normal performance group					Randomly selecte 5,6,7,8,9 such tha is in the redu performance g			
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50					5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50					5MHz: N_{RB} = 10MHz: N_{RB} =			
OCNG patterns		OP.16 FDD (5MHz) OP.2 FDD (10MHz)					OP.16 FDD (5MHz) OP.2 FDD (10MHz)					OP.16 FDD (5M OP.2 FDD (10M			
PBCH_RA	dB	0					0					0			
PBCH_RB	dB														
PSS_RA	dB														
SSS_RA	dB														
PCFICH_RB	dB														
PHICH_RA	dB														
PHICH_RB	dB														
PDCCH_RA	dB														
PDCCH_RB	dB														
PDSCH_RA	dB														
PDSCH_RB	dB														
OCNG_RA Note 1	dB														
OCNG_RB Note 1	dB														
Qrxlevmin	dBm	-140					-140					-140			
N_{oc} Note 2	dBm/15 kHz	-99.15					-99.15					-99.15			
$\hat{E}_s / N_{oc}$	dB	15.10	8	8	8	15.10	8	15.10	8	8	8	8	8	15.10	
$\hat{E}_s / I_{ot}$	dB	15.10	8	8	8	15.10	8	15.10	8	8	8	8	8	15.10	
RSRP Note 3	dBm/15 kHz	-84.05	-91.15	-91.15	-91.15	-84.05	-91.15	-84.05	-91.15	-91.15	-91.15	-91.15	-91.15	-84.05	
$Treselection_{EUTRAN}$	s	0					0					0			
Snonintrasearch	dB	62					62					62			
Propagation Condition		AWGN					AWGN					AWGN			
Antenna Configuration		1x2					1x2					1x2			
Timing offset to Cell 1		-					3ms					3ms			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is ac
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and AWGN of appropriate power for to be fulfilled.
Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable param

The reselection delays shall meet the requirements in table 4.2.10.5-2.

Table 4.2.10.5-2: Reselection delay requirements

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	20.5
T2	Cell 3 (reduced performance group)	193.3
T3	Cell 4 (reduced performance group)	193.3
T4	Cell 1 (normal performance group)	20.5

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $K_{carrier,normal}$ * $T_{evaluate,E-UTRAN\_Inter}$, + T_{SI} , and to a reduced performance group cell can be expressed as: 6* $K_{carrier,reduced}$ * $T_{evaluate,E-UTRAN\_Inter}$, + T_{SI},

This gives a total of 20.48 s for normal performance group reselection and 193.28 s for reduced performance group reselection, allow 20.5 s for normal performance group and 193.3 s for reduced performance group in the test case. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.2.11 E-UTRAN TDD – TDD reselection using an increased number of carriers

4.2.11.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements using an increased number of carriers.

4.2.11.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports increased number of carrier monitoring.

4.2.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.10.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4, 4.2.2.9a and A.4.2.11.

4.2.11.4 Test description

4.2.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure TBD (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.11.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.2.11.4.3.

5. There are eight E-UTRA FDD inter frequency cells on 8 different carriers in the neighbour list of cell 1which is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.11.4.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2,3,4 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3, cell 4	
T2 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T2
	Neighbour cell		Cell 1, cell 2, cell 4	
T3 end condition	Active cell		Cell4	UE shall perform reselection to cell 4 during T3
	Neighbour cell		Cell 1, cell 2, cell 3	
T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell 2, cell 3, cell 4	
UE configured E-UTRA RF Channel Number			1, 2,3,4,5,6,7,8,9	Serving cell and eight xDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration			Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [16]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(Test equipment frequency selection and configuration time) + 960	T0 is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		s	25	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	200	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	200	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

4.2.11.4.2 Test procedure

The test consists of 8 E-UTRA TDD interfrequency cells on 8 different carriers in the neighbour list of cell 1. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2, 3 and 4 which are chosen from the 8 intefrequency layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2, 3 and 4 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test. Cell 1, 2, 3 and 4 are identified by the UE during time phase T0. Cell 1, cell 2, cell 3 and cell 4 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2, 3 or 4. Cells 1, 2, 3 and 4 all have equal absolute priority.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2, Cell 3 and Cell 4 physical cell identities = initial Cell 2, Cell 3 and Cell 4 physical cell identities.

2. Set the parameters according to T0 in Table 4.2.11.5-1. Propagation conditions are set according to Annex B clause B.1.1. T0 starts.

3. Set Cell 2, 3 and 4 physical cell identities = ((current cell 2, 3 and 4 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T0 expires, the SS shall switch the power setting from T0 to T1 as specified in Table 4.2.11.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T1 within 20.5 seconds from the beginning of time period T1, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, continue with step 8. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, skip to step 20.

8. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.11.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 3.

10. If the UE responds on the newly detectable cell, Cell 3 during time duration T2 within 193.3 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 3”. Otherwise count a fail for the event “Re-select newly detected Cell 3”.

11. If the UE has re-selected Cell 3 within T2, after the re-selection or when T2 expires, continue with step 12. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 20.

12. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.11.5-1.

13. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 4.

14. If the UE responds on the newly detectable cell, Cell 4 during time duration T3 within 193.3 seconds from the beginning of time period T3, then count a success for the event “Re-select newly detected Cell 4”. Otherwise count a fail for the event “Re-select newly detected Cell 4”.

15. If the UE has re-selected Cell 4 within T3, after the re-selection or when T3 expires, continue with step 16. Otherwise, if T3 expires and the UE has not yet re-selected Cell 4, skip to step 20.

16. The SS shall switch the power setting from T3 to T4 as specified in Table 4.2.11.5-1.

17. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

18. If the UE responds on the already detected cell, Cell 1 during time duration T4 within 20.5 seconds from the beginning of time period T4, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

19. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 13. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 20.

20. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

21. Repeat step 2-20 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell” and “Re-select already detected Cell” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict. If both events pass, the test passes. If one event fails, the test fails.

4.2.11.4.3 Message contents

Same as 4.2.10.4.3.

4.2.11.5 Test requirement

Tables 4.2.11.4.1-1 and 4.2.11.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter-frequency cell re-selection using an increased number of carriers test case.

Table 4.2.11.5-1: Cell specific test parameters for TDD-TDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	Cell 1					Cell 2					Cell 3					Cell 4				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
E-UTRA RF Channel number		1					Randomly selected from 2,3,4 such that cell 2 is in the normal performance group					Randomly selected from 5,6,7,8,9 such that cell 3 is in the reduced performance group					Randomly selected from 5,6,7,8,9 such that cell 4 is in the reduced performance group				
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50					5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50					5MHz: N_{RB} = 25 10MHz: N_{RB} = 50					5MHz: N_{RB}= 25 10MHz: $N_{RB,}$ = 50				
OCNG Patterns		5MHz: OP.10 TDD 10MHz: OP.2 TDD					5MHz: OP.10 TDD 10MHz: OP.2 TDD					5MHz: OP.10 TDD 10MHz: OP.2 TDD					5MHz: OP.10 TDD 10MHz: OP.2 TDD				
PBCH_RA	dB	0					0					0					0				
PBCH_RB	dB																				
PSS_RA	dB																				
SSS_RA	dB																				
PCFICH_RB	dB																				
PHICH_RA	dB																				
PHICH_RB	dB																				
PDCCH_RA	dB																				
PDCCH_RB	dB																				
PDSCH_RA	dB																				
PDSCH_RB	dB																				
OCNG_RA Note 1	dB																				
OCNG_RB Note 1	dB																				
Qrxlevmin	dBm	-140					-140					-140					-140				
N_{oc} Note 2	dBm15 kHz	-99.15					-99.15					-99.15					-99.15				
$\hat{E}_s / N_{oc}$	dB	15.10	8	8	8	14	8	15.10	8	8	8	8	8	15.10	8	8	8	8	8	15.10	8
$\hat{E}_s / I_{ot}$	dB	15.10	8	8	8	14	8	15.10	8	8	8	8	8	15.10	8	8	8	8	8	15.10	8
RSRP Note 3	dBm/15 kHz	-84.05	-91.15	-91.15	-91.15	-84.05	-91.15	-84.05	-91.15	-91.15	-91.15	-91.15	-91.15	-84.05	-91.15	-91.15	-91.15	-91.15	-91.15	-84.05	-91.15
$Treselection_{EUTRAN}$	s	0					0					0					0				
Snonintrasearch	dB	62					62					62					62				
Propagation Condition		AWGN					AWGN					AWGN					AWGN				
Antenna Configuration		1x2					1x2					1x2					1x2				
Timing offset to Cell 1		-					3ms					3ms					3ms				

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.
Note 3:	Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The reselection delays shall meet the requirements in table 4.2.11.5-1

Table 4.2.11.5-2 : Reselection delay requirements

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	20.5
T2	Cell 3 (reduced performance group)	193.3
T3	Cell 4 (reduced performance group)	193.3
T4	Cell 1 (normal performance group)	20.5

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $K_{carrier,normal}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, + T_{SI} , and to a reduced performance group cell can be expressed as: 6* $K_{carrier,reduced}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$, + T_{SI},

This gives a total of 20.48 s for normal performance group reselection and 193.28 s for reduced performance group reselection, allow 20.5 s for normal performance group and 193.3 s for reduced performance group in the test case. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.2.12 E-UTRAN FDD – FDD Intra frequency case for CE UE in normal coverage

4.2.12.1 Test purpose

To verify for a CE UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

4.2.12.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The cell re-selection delay shall be less than $T_{evaluate\ E\text{-}UTRAN\_Intra}$ + $T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The CAT-M1 UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The CAT-M1 UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,\ EUTRAN\_Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked.

The CAT-M1 UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The CAT-M1 UE shall filter RSRP measurement of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the CAT-M1 UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluateFDD,Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when

Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for re-selection, the side conditions are RSRP and SCh apply to both serving and non-serving intra-frequency cells.

If $T_{reselection}$ timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the CAT-M1 UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the CAT-M1 UE shall re-select that cell.

The CAT-M1 UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $T_{reselection}$ is used, the CAT-M1 UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $T_{reselection}$ timer.

At intra-frequency cell re-selection, the CAT-M1 UE shall monitor the downlink of serving cell for paging reception until the CAT-M1 UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the CAT-M1 UE shall be capable of monitoring at least:

- Intra-frequency carrier

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a CAT-M1 UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.12.

4.2.12.4 Test description

4.2.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.12.4.3.
5. There is one E-UTRA FD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.12.4.1-1: General test parameters for FDD intra frequency cell reselection test case for CE UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			PRACH_2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.12.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.12.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.12.4.3 Message contents

Message contents are according to 3GPP TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.12.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 4.2.12.4.3-2: Void

4.2.12.5 Test requirement

Tables 4.2.12.4.1-1 and 4.2.12.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for normal coverage cell re-selection test case.

Table 4.2.12.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case for CE UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16	12	16.45	-infinity	16.45	12
$\hat{E}_s / I_{ot}$	dB	16	-4.55	4.18	-infinity	4.18	-4.55
RSRP Note3	dBm/15 kHz	-82	-86	-81.55	-infinity	-81.55	-86
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.13 E-UTRAN HD – FDD Intra frequency case for CE UE in normal coverage

4.2.13.1 Test purpose

To verify for a CE UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.13.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

4.2.13.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.12.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.13.

4.2.13.4 Test description

4.2.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.12.4.3
5. There is one E-UTRA HD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.13.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for CE UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			PRACH_2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.13.4.2 Test procedure

Same test procedure as in clause 4.2.12.4.2 with the following exceptions:

- Instead of Table 4.2.12.5-1 → use Table 4.2.13.5-1.

4.2.13.4.3 Message contents

Same message contents as in clause 4.2.12.4.3.

4.2.13.5 Test requirement

Tables 4.2.13.4.1-1 and 4.2.13.5-1 defines the primary level settings including test tolerances for E-UTRAN HD FDD – FDD Intra frequency case for normal coverage cell re-selection test case.

Table 4.2.13.5-1: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for CE UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16	12	16.45	-infinity	16.45	12
$\hat{E}_s / I_{ot}$	dB	16	-4.55	4.18	-infinity	4.18	-4.55
RSRP Note3	dBm/15 kHz	-82	-86	-81.55	-infinity	-81.55	-86
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.14 E-UTRAN TDD – TDD Intra frequency case for CE UE in normal coverage

4.2.14.1 Test purpose

To verify for a UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

4.2.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.12.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.14.

4.2.14.4 Test description

4.2.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.14.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.14.4.1-1: General test parameters for TDD intra frequency cell re-selection test case for CE UE

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211
PRACH Configuration			PRACH 2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.14.4.2 Test procedure

Same test procedure as in clause 4.2.12.4.2 with the following exceptions:

- Instead of Table 4.2.12.5-1 → use Table 4.2.14.5-1.

4.2.14.4.3 Message contents

Same as in Clause 4.2.12.4.3.

4.2.14.5 Test requirement

Tables 4.2.14.4.1-1, and 4.2.14.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency case for normal coverage cell re-selection test case.

Table 4.2.14.5-1: Cell specific test parameters for TDD intra frequency cell re-selection test case for CE UE in AWGN in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16	12	16.45	-infinity	16.45	12
$\hat{E}_s / I_{ot}$	dB	16.00	-4.55	4.18	-infinity	4.18	-4.55
RSRP Note3	dBm/15 kHz	-82	-86	-81.55	-infinity	-81.55	-86
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI\text{-}EUTRA}$, and to an already detected cell can be expressed as: $T_{evaluate,\ E\text{-}UTRAN\_intra} + T_{SI\text{-}EUTRA}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3 of TS 36.133 [4]

$T_{evaluate,EUTRAN\_intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3 of TS 36.133 [4]

$T_{SI-EUTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.15 E-UTRAN FDD – FDD Intra frequency case for CE UE in enhanced coverage

4.2.15.1 Test purpose

To verify for a CE UE that when the current and target cell operates on the same carrier frequency in enhanced coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.15.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

4.2.15.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The cell re-selection delay shall be less than $T_{evaluate,\ E\text{-}UTRAN\_intra\_EC} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The requirements in this subclause apply if UE is in the enhanced coverage area of the neighbour cell. The UE category M1 and enhanced coverage applicability of the requirements is defined in section 3.6 of TS 36.133 [4]. The UE is considered to be in enhanced coverage area of serving cell according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot of the neighbour cell defined in Annex B.1.3 of TS 36.133 [4] for a corresponding Band.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities. The UE shall not cause any interruption to the paging reception and acquisition of SI while performing measurement on serving or any neighbour cells.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS 36.304[6] within $T_{detect,EUTRAN\_Intra\_EC}$ when that Treselection= 0.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra\_EC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurements of each measured intra-frequency cell using at least 4 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra\_EC}/2$.

The UE shall not consider an E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS 36.304[6] within $T_{evaluate,E\text{-}UTRAN\_intra\_EC}$ when $T_{reselection} = 0$, provided that the cell is at least 5dB better ranked

If $T_{reselection}$ timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Intra\_EC}$, $T_{measure,EUTRAN\_Intra\_EC}$ and $T_{evaluate,\ E\text{-}UTRAN\_intra\_EC}$ are specified in Table 4.2.15.3-1.

Table 4.2.15.3-1: $T_{detect,EUTRAN\_Intra\_EC}$, $T_{measure,EUTRAN\_Intra\_EC}$ and $T_{evaluate,\ E\text{-}UTRAN\_intra\_EC}$

SCH Ês/Iot of neighboring cell: Q2	DRX cycle length [s]	$T_{detect,EUTRAN\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_intra\_EC}$ [s] (number of DRX cycles)
-15≤ Q2 < -6	0.32	330.24 (1032)	1.28 (4)	10.24 (32)
	0.64	330.24 (516)	1.28 (2)	10.24 (16)
	1.28	524.8 (410)	1.28 (1)	12.8 (10)
	2.56	1039.36 (406)	2.56 (1)	15.36 (6)
Q2≥-6	0.32	16.64 (52)	1.28 (4)	10.24 (32)
	0.64	23.04 (36)	1.28 (2)	10.24 (16)
	1.28	38.4 (30)	1.28 (1)	12.8 (10)
	2.56	66.56 (26)	2.56 (1)	15.36 (6)

Table 4.2.15.3-2: Void

Table 4.2.15.3-3: Void

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.15.

4.2.15.4 Test description

4.2.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.15.4.3.
5. There is one E-UTRA FD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.15.4.1-1: General test parameters for FDD intra frequency cell reselection test case for CE UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.9
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.15.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.15.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.15.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 338 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, continue with step 8 without waiting for T2 to expire. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.15.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 18 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.15.4.3 Message contents

Same as in clause 4.2.12.4.3.

4.2.15.5 Test requirement

Tables 4.2.15.4.1-1 and 4.2.15.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for enhanced coverage cell re-selection test case.

Table 4.2.15.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case for CE UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns defined in clause D.1.2		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s / I_{ot}$	dB	-7	-12.87	6.82-	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra\_EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ E\text{-}UTRAN\_intra\_EC} + T_{SI}$.

Where:

$T_{detect,EUTRAN\_Intra\_EC}$ See Table 4.2.15.3-1

$T_{evaluate,\ E\text{-}UTRAN\_intra\_EC}$ See Table 4.2.15.3-1

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.16 E-UTRAN HD – FDD Intra frequency case for CE UE in enhanced coverage

4.2.16.1 Test purpose

To verify for a CE UE in enhanced coverage that the UE is able to search and measure cells to meet the respective HD-FDD intra-frequency cell re-selection requirements.

4.2.16.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

4.2.16.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.15.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.16.

4.2.16.4 Test description

4.2.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.12.4.3
5. There is one E-UTRA HD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.16.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for CE UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.3.16 in TS 36.133 [4]
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.16.4.2 Test procedure

Same test procedure as in clause 4.2.15.4.2 with the following exceptions:

- Instead of Table 4.2.15.5-1 → use Table 4.2.16.5-1.

4.2.16.4.3 Message contents

Same message contents as in clause 4.2.15.4.3.

4.2.16.5 Test requirement

Tables 4.2.16.4.1-1 and 4.2.16.5-1 defines the primary level settings including test tolerances for E-UTRAN HD FDD – FDD Intra frequency case for enhanced coverage cell re-selection test case.

Table 4.2.16.5-1: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for CE UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s / I_{ot}$	dB	-7	-12.87	-6.82	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.17 E-UTRAN TDD – TDD Intra frequency case for CE UE in enhanced coverage

4.2.17.1 Test purpose

To verify for a CE UE in enhanced coverage that the UE is able to search and measure cells to meet the respective TDD-TDD intra-frequency cell re-selection requirements.

4.2.17.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

4.2.17.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.15.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.17.

4.2.17.4 Test description

4.2.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.17.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.17.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.17.4.1-1: General test parameters for TDD intra frequency cell re-selection test case for CE UE

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211
PRACH Parameters			PRACH_4CE	Refer to A.3.16 in TS 36.133 [4]
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.17.4.2 Test procedure

Same test procedure as in clause 4.2.15.4.2 with the following exceptions:

- Instead of Table 4.2.15.5-1 → use Table 4.2.17.5-1.

4.2.17.4.3 Message contents

Same as in Clause 4.2.12.4.3.

4.2.17.5 Test requirement

Tables 4.2.17.4.1-1, and 4.2.17.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency case for enhanced coverage cell re-selection test case.

Table 4.2.17.5-1: Cell specific test parameters for TDD intra frequency cell re-selection test case for CE UE in AWGN in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s / I_{ot}$	dB	-7	-12.87	-6.82	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.18 HD-FDD Intra frequency cell reselection for Category NB1 UE in In-Band Mode under Normal Coverage

4.2.18.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the Cat-NB1 UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.18.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

4.2.18.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,NB\_intra\text{-}NC} + T_{SI\text{-}NB}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform NRSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS 36.304 [6] within T_{detect,NB_Intra_NC} as defined in table 4.6.2.2-1 of TS 36.133 [4] clause 4.6.2.2 when Treselection= 0. An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in TS 36.133 [4] Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_NC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter NRSRP measurements of each measured intra-frequency cell using at least [2] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Intra\text{-}NC}/2$.

The UE shall not consider an NB-IoT neighbour cell in cell reselection if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS 36.304 [6] within $T_{evaluate,NB\_intra\text{-}NC}$ as defined in table 4.6.2.2-1 of TS 36.133 [4] clause 4.6.2.2 when $T_{reselection} = 0$, provided that the cell is at least 3dB better ranked. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

If $T_{reselection}$ timer has a non zero value and the intra-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving NB-IoT cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed T_{SI-NB} + 100 ms. T_{SI-NB} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a NB-IoT cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2 and A.4.2.18.

4.2.18.4 Test description

4.2.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 4.2.18.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.
2. The parameter settings for the cells are set up according to Table 4.2.18.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There are one NB-IoT carrier and one E-UTRA FDD carrier and four cells specified in the test. Ncell1 is inband cell to Cell1 and Ncell2 is inband cell to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.18.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		eCell1, eCell2, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		eCell1, eCell2, Ncell1	
Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell1 and eCell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			NPRACH.R-1	Refer to Table A.10.3-1
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	60	T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to Ncell2 (within T2) T3 starts.
T3		s	15	T3 is defined so that cell re-selection time is taken into account.

4.2.18.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with two LTE Cells and one NB-IoT carrier with 2 Ncells of different physical cell ID. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Ncell1 is already identified by the UE prior to the start of the test, i.e. Ncell 2 is not identified. Ncell 1 and Ncell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Ncell 2.

In the following test procedure "UE responds" means "UE starts transmitting preamble on NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 8.1.5A.5"

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

2. Set the parameters according to T1 in Table 4.2.18.5-1 and 4.2.18.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set eCell 2 physical cell identity = ((current eCell 2 physical cell identity + 1) mod 14 + 2) and Ncell2 physical cell identity = ((current Ncell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

   If:

   - (PCID of NCELL2) mod 6 = (PCID of ECELL2) mod 6

   - PCID of NCELL1 ≠ PCID of NCELL2

   Continue with Step 4. Else repeat Step 3.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.18.5-1 and 4.2.18.5-2.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Ncell 2.

6. If the UE responds on the newly detectable cell, Ncell 2, during time duration T2 within 60 seconds from the beginning of time period T2, then count a success for the event "Re-select newly detected Ncell 2". Otherwise count a fail for the event "Re-select newly detected Ncell 2".

7. If the UE has re-selected Ncell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Ncell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.18.5-1 and 4.2.18.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Ncell 1.

10. If the UE responds on the already detected cell, Ncell 1, during time duration T3 within 15 seconds from the beginning of time period T3, then count a success for the event "Re-select already detected Ncell 1". Otherwise count a fail for the event "Re-select already detected Ncell 1".

11. If the UE has re-selected Ncell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Ncell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events "Re-select newly detected Ncell 2" and "Re-select already detected Ncell 1" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 4.2.18.4.3-1: SystemInformationBlockType4: HD-FDD Intra frequency cell reselection for Category NB1 UE for Ncell 2

Derivation Path: TS 36.508 [7] clause 8.1.4.3.3, Table 8.1.4.3.3-3: SystemInformationBlockType4-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList-r13 SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {}			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Ncell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

4.2.18.5 Test requirement

Tables 4.2.18.4.1-1, 4.2.18.5-1 and 4.2.18.5-2 defines the primary level settings including test tolerances for HD-FDD intra frequency cell re-selection test case.

Table 4.2.18.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	180			180		
PRB location within Cell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30			eCell 2 $BW_{channel}$ 5MHz: 17 eCell 2 $BW_{channel}$ 10MHz: 30		
NPBCH_RA	dB	-3			-3		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		NRSRP			NRSRP		
N_{oc}	dBm/15 kHz	Specified in Table 4.2.18.5-2					
$\hat{E}_s / N_{oc}$	dB	17	13	17.45	-infinity	17.45	13
$\hat{E}_s / I_{ot}$ Note2	dB	17	-4.53	4.24	-infinity	4.24	-4.53
NRSRP Note2	dBm/15 kHz	-81	-85	-80.55	-infinity	-80.55	-85
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Ncell 1	ms	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.18.5-2 : eCell 1 and eCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	eCell 1			eCell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5 or 10			5 or 10		
NOCNG Pattern defined in clause D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD			$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10 MHz. NOP.1 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$ Note2	dBm	3	3	3	3	3	3
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to eCell1	Ms	-			3		

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Note 3: Void

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Ncell 2, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 2.

The cell re-selection delay to a newly detectable cell shall be less than 59.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Ncell 1, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 1.

The cell re-selection delay to an already detected cell shall be less than 14.82 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC} + T_{SI\text{-}NB}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC} + T_{SI\text{-}NB}$,

Where:

$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ as specified in TS 36.133 [4] Table 4.6.2.2-1 in clause 4.6.2.2.

$T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC}$ as specified in TS 36.133 [4] Table 4.6.2.2-1 in clause 4.6.2.2.

$T_{SI\text{-}NB}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 59.32 s, allow 60 s for the cell re-selection delay to a newly detectable cell and 14.82 s, and allow 15s for the cell re-selection delay to an already detected cell in the test case.

4.2.19 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage

4.2.19.1 Test purpose

To verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6.2.4.

4.2.19.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

4.2.19.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC} + T_{SI\text{-}NB}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform NRSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS 36.304 [6] within T_{detect,NB_Intra_EC} when that Treselection= 0. An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in TS 36.133 [4] Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_EC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter NRSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Intra\text{-}EC}/2$.

The UE shall not consider an NB-IoT neighbour cell in cell reselection if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS 36.304 [6] within $T_{evaluate,NB\_intra\_EC}$ when $T_{reselection} = 0$, provided that the cell is at least XdB better ranked, where 'X' is specified in Table 4.6.2.4-3. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

If $T_{reselection}$ timer has a non zero value and the intra-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving NB-IoT cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI\text{-}NB}$ + 100 ms. $T_{SI\text{-}NB}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a NB-IoT cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2 and A.4.2.19.

4.2.19.4 Test description

4.2.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 4.2.19.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.
2. The parameter settings for the cells are set up according to Table 4.2.19.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There are one NB-IoT carrier and one E-UTRA FDD carrier and four cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.19.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Cell2, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Cell2, Ncell1	
Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			NPRACH.R-1	Refer to Table A.10.3-1
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	67	T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to Ncell2 (within T2) T3 starts.
T3		s	22	T3 is defined so that cell re-selection time is taken into account.

4.2.19.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with 2 Cells and one NB-IoT carrier with 2 Ncells of different physical cell ID. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Ncell1 is already identified by the UE prior to the start of the test, i.e. Ncell 2 is not identified. Ncell 1 and Ncell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Ncell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 8.1.5A.5”

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

2. Set the parameters according to T1 in Table 4.2.19.5-1 and 4.2.19.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set eCell 2 physical cell identity = ((current eCell 2 physical cell identity + 1) mod 14 + 2) and Ncell 2 physical cell identity = ((current Ncell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.19.5-1 and 4.2.19.5-2.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Ncell 2.

6. If the UE responds on the newly detectable cell, Ncell 2, during time duration T2 within 67 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Ncell 2”. Otherwise count a fail for the event “Re-select newly detected Ncell 2”.

7. If the UE has re-selected Ncell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Ncell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.19.5-1 and 4.2.19.5-2.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Ncell 1.

10. If the UE responds on the already detected cell, Ncell 1, during time duration T3 within 22 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Ncell 1”. Otherwise count a fail for the event “Re-select already detected Ncell 1”.

11. If the UE has re-selected Ncell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Ncell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Ncell 2” and “Re-select already detected Ncell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.19.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 4.2.19.4.3-1: SystemInformationBlockType4: HD-FDD Intra frequency cell reselection for Category NB1 UE for Ncell 2

Derivation Path: TS 36.508 [7] clause 8.1.4.3.3, Table 8.1.4.3.3-3: SystemInformationBlockType4-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList-r13 SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {}			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Ncell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

4.2.19.5 Test requirement

Tables 4.2.19.4.1-1, 4.2.19.5-1 and 4.2.19.5-2 defines the primary level settings including test tolerances for HD-FDD intra frequency cell re-selection test case.

Table 4.2.19.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	180			180		
PRB location within Cell	-	Cell 1 BWchannel 5MHz: 17 Cell 1 BWchannel 10MHz: 30			Cell 1 BWchannel 5MHz: 17 Cell 1 BWchannel 10MHz: 30		
NPBCH_RA	dB	-3			-3		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-156	-156	-156	-156	-156	-156
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and reselection_quality_measurement		NRSRP			NRSRP		
N_{oc}	dBm/15 kHz	Specified in Table 4.2.19.5-2					
$\hat{E}_s / N_{oc}$	dB	-9	-9	-0.25	-infinity	-0.25	-9
$\hat{E}_s / I_{ot}$ Note2	dB	-9	-11.89	-0.76	-infinity	-0.76	-11.89
NRSRP Note2	dBm/15 kHz	-107	-107	-98.25	-infinity	-98.25	-107
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Ncell 1	ms	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.19.5-2: Cell 1, Cell2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5 or 10			5 or 10		
NOCNG Pattern defined in clause D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD			$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$ Note2	dBm	3	3	3	3	3	3
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to eCell 1	ms	-			3		

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Note 3: Void

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Ncell 2, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 2.

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Ncell 1, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 1.

The cell re-selection delay to an already detected cell shall be less than 21.12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$,

Where:

$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}EC}$ as specified in TS 36.133 [4] Table 4.6.2.4-1 in clause 4.6.2.4.

$T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC}$ as specified in TS 36.133 [4] Table 4.6.2.4-1 in clause 4.6.2.4.

$T_{SI\text{-}NB}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 66.32 s, allow 67 s for the cell re-selection delay to a newly detectable cell and 21.12 s, and allow 22 s for the cell re-selection delay to an already detected cell in the test case.

4.2.20 E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis

4.2.20.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the category 1bis UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.20.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

4.2.20.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate\ E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP and RSRQ measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 [6] within $T_{detect,EUTRAN\_Intra}$ when that Treselection= 0. An intra frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in

- Annex B.1.3 for Cat-M1 UE
- Annex B.1.6 for category 1bis UE
- Annex B.1.1, otherwise

for a corresponding Band.

The UE shall measure RSRP and RSRQ at least every $T_{measure,EUTRAN\_Intra}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP and RSRQ measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}/2$

The UE shall not consider an E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined TS36.304 [6] within $T_{evaluate,E\text{-}UTRAN\_intra}$ when $T_{reselection} = 0$, provided that the cell is

- at least 4dB better ranked for Cat-M1 UE and category 1bis UE
- at least 3 dB better ranked, otherwise

When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

If $T_{reselection}$ timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.20.

4.2.20.4 Test description

4.2.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A. 93.
2. The general test parameter settings are set up according to Table 4.2.20.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.20.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.20.4.1-1: General test parameters for FDD intra frequency cell reselection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.20.4.2 Test procedure

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.20.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.20.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.20.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.20.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.20.4.3-1: Common Exception messages for E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.20.5 Test requirement

Tables 4.2.20.4.1-1 and 4.2.20.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis test case.

Table 4.2.20.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.3.2.1.2		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	17	13	17.45	-infinity	17.45	13
$\hat{E}_s / I_{ot}$	dB	17	-4.53	4.24	-infinity	4.24	-4.53
RSRP Note3	dBm/15 kHz	-81	-85	-80.55	-infinity	-80.55	-85
Treselection	s	0			0		
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,EUTRAN\_Intra} + T_{SI}$

$T_{detect,E\text{-}UTRAN\_Intra}$ = 32 s; See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause A.4.2.20.2

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E-UTRAN\_intra} + T_{SI}$

$T_{evaluate,E-UTRAN\_Intra}$ = 6.40 s; See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause A.4.2.20.2

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.21 E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis

4.2.21.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the category 1bis UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.21.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

4.2.21.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.20.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.21.

4.2.21.4 Test description

4.2.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.21.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.21.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.21.4.1-1: General test parameters for TDD intra frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.21.4.2 Test procedure

Same test procedure as in clause 4.2.20.4.2 with the following exceptions:

- Instead of Table 4.2.20.5-1 → use Table 4.2.21.5-1.

4.2.21.4.3 Message contents

Same message content as in clause 4.2.20.4.3.

4.2.21.5 Test requirement

Tables 4.2.21.4.1-1 and 4.2.21.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis test case.

Table 4.2.21.5-1: Cell specific test parameters for TDD intra frequency cell re-selection test case in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in A.3.2.2.2		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	17	13	17.45	-infinity	17.45	13
$\hat{E}_s / I_{ot}$	dB	17	-4.53	4.24	-infinity	4.24	-4.53
RSRP Note3	dBm/15 kHz	-81	-85	-80.55	-infinity	-80.55	-85
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1 Synchronous cells	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,EUTRAN\_Intra} + T_{SI}$

$T_{detect,E\text{-}UTRAN\_Intra}$ = 32 s; See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause A.4.2.21.2

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E\text{-}UTRAN\_intra} + T_{SI}$

$T_{evaluate,E\text{-}UTRAN\_Intra}$ = 6.40 s; See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause A.4.2.21.2

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.22 E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag

4.2.22.1 Test purpose

To verify that when the current and target cell operates on the same FDD carrier frequency the UE configured with *highSpeedEnhancedMeasFlag* is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.22.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 14 and forward that supports measurement enhancements in high speed scenario.

4.2.22.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate\ E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,\ EUTRAN\_Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurement of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra} / 2$.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluateFDD,Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for re-selection, the side conditions are RSRP and SCh apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of Treselection is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the Treselection timer.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Intra-frequency carrier

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.22.

4.2.22.4 Test description

4.2.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.22.4.1-1.

3. Propagation conditions are set according to Annex B clause B.1.

4. Message contents are as defined in clause 4.2.22.4.3

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.22.4.1-1: General test parameters for E-UTRAN FDD – FDD Intra frequency case for UE configured with highSpeedEnhancedMeasFlag

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤20	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤8	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.22.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.22.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 15 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.1.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 5 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.22.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks on condition of HighSpeedEnhance with exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.22.5 Test requirement

Tables 4.2.22.4.1-1 and 4.2.22.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency cell re-selection test case.

Table 4.2.22.5-1: Cell specific test parameters for E-UTRAN FDD – FDD Intra frequency case for UE configured with highSpeedEnhancedMeasFlag

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100			5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		
OCNG Patterns defined in A.3.2.1		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note 1 OCNG_RB Note 1	dB	-3			-3		
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16	13	16.45	-infinity	16.45	13
$\hat{E}_s / I_{ot}$	dB	16	-3.55	3.24	-infinity	3.24	-3.55
RSRP Note3	dBm/15 kHz	-82	-85	-81.55	-infinity	-81.55	-85
Treselection	s	0			0		
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN 1750Hz Note4		
Antenna Configuration		2x2			2x2		
Timing offset to Cell 1 Synchronous cells	us	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The AWGN 1750Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1750Hz.

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{detect,E\text{-}UTRAN\_Intra}$ = 12.8 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI-EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to a newly detectable cell shall be less than a total of 15 seconds in this test case (note: this gives a total of 14.08 seconds but the test allows 15 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Intra}$ = 3.84 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI-EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to an already detected cell shall be less than a total of 6 seconds in this test case (note: this gives a total of 5.12 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.23 E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag

4.2.23.1 Test purpose

To verify that when the current and target cell operates on the same TDD carrier frequency the UE configured with *highSpeedEnhancedMeasFlag* is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.23.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 14 and forward, which is configured with *highSpeedEnhancedMeasFlag*.

4.2.23.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,EUTRAN\_Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 when $T_{reselection}$ = 0.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluate,E-UTRAN\_Intra}$ as defined in table 4.2.2.3-3 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.2.

4.2.23.4 Test description

4.2.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.2.23.4.1-1.

3. Propagation conditions are set according to Annex B clause B.1.

4. Message contents are as defined in clause 4.2.23.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.23.4.1-1: General test parameters for E-UTRAN TDD – TDD Intra frequency case for UE configured with highSpeedEnhancedMeasFlag

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤20	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤8	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.23.4.2 Test procedure

The test comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables 4.2.23.4.1-1and 4.2.23.5-1. The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively. *highSpeedEnhancedMeasFlag* is broadcasted to UE. Only cell 1 is already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.23.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.23.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2, during time duration T2 within 15 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.2.5-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1, during time duration T3 within 6 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.23.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.2.23.5 Test requirement

Tables 4.2.23.4.1-1, and 4.2.23.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency cell re-selection test case.

Table 4.2.23.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD intra frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100			5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		
OCNG Pattern defined in A.3.2.2		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	16	13	16.45	-infinity	16.45	13
$\hat{E}_s / I_{ot}$	dB	16	-3.55	3.24	-infinity	3.24	-3.55
RSRP Note3	dBm/15 kHz	-82	-85	-81.55	-infinity	-81.55	-85
Treselection	s	0			0		
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN 1750Hz Note4		
Antenna Configuration		2x2			2x2		
Timing offset to Cell 1 Synchronous cells	us	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The AWGN 1750Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1750Hz.

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,EUTRAN\_Intra} + T_{SI-EUTRA}$

$T_{detect,EUTRAN\_Intra}$ = 12.8s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.7.

The cell re-selection delay to a newly detectable cell shall be less than a total of 15 seconds in this test case (note: this gives a total of 14.08 seconds but the test allows 15 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Intra}$ = 3.84 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7.

The cell re-selection delay to an already detected cell shall be less than a total of 6 seconds in this test case (note: this gives a total of 5.12 seconds but the test allows 6 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.24 HD – FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage

4.2.24.1 Test purpose

To verify the requirement for the HD-FDD inter frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6.2.6.

4.2.24.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

4.2.24.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,\ NB\_Inter\text{-}EC} + T_{SI}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform NRSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving NB-IoT cell, even if no explicit neighbour list with physical layer cell identities is provided.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS 36.304 within $P_{carrier} * T_{detect,NB\_Inter\_EC}$. An inter-frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in Annex B.1.5 for a corresponding Band.

The UE shall filter NRSRP measurements of each measured inter-frequency cell using at least [2] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Inter\_NB\text{-}IoT\_EC}/2$.

If an inter-frequency cell has been already detected but that has not been reselected to the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 within $P_{carrier} * T_{evaluate,NB\_Inter\_EC}$. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and inter-frequency NB-IoT cells.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving NB-IoT cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed T_{SI} + 100 ms. T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a NB-IoT cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2 and A.4.2.24.

4.2.24.4 Test description

4.2.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for band 31 where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 4.2.19.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.
2. The parameter settings for the cells are set up according to Table 4.2.24.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There are one NB-IoT carrier and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.24.4.1-1: General test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Ncell1	

Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			NPRACH.R-1	Refer to Table A.10.3-1
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		S	5	During T0, UE decodes SIB3-NB and SIB5-NB to acquire the inter-frequency carrier information.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	67	T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to Ncell2 (within T2) T3 starts.
T3		s	22	T3 is defined so that cell re-selection time is taken into account.

4.2.24.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with one Cell and one NB-IoT carrier with 2 Ncells of different physical cell ID. The test consists of four successive time periods, with time duration of T0, T1, T2 and T3 respectively. Only Ncell1 is already identified by the UE prior to the start of the test, i.e. Ncell 2 is not identified. Ncell 1 and Ncell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Ncell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 8.1.5A.5”

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.
2. Set the parameters according to T0 in Table 4.2.24.5-1 and 4.2.24.5-2. Propagation conditions are set according to Annex B clause B.1.1. T0 starts.
3. Set the parameters according to T1 in Table 4.2.24.5-1 and 4.2.24.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. Alternate between Ncell 2 physical cell identity = 6 and Ncell 2 physical cell identity = 12 for one iteration of the test procedure loop.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.24.5-1 a6d 4.2.24.5-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Ncell 2.
7. If the UE responds on the newly detectable cell, Ncell 2, during time duration T2 within 67 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Ncell 2”. Otherwise count a fail for the event “Re-select newly detected Ncell 2”.
8. If the UE has re-selected Ncell 2 within T2, after the re-selection or when T2 expires, continue with step 9. Otherwise, if T2 expires and the UE has not yet re-selected Ncell 2, skip to step 12.
9. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.24.5-1 and 4.2.24.5-2.
10. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Ncell 1.

11. If the UE responds on the already detected cell, Ncell 1, during time duration T3 within 22 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Ncell 1”. Otherwise count a fail for the event “Re-select already detected Ncell 1”.

12. If the UE has re-selected Ncell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Ncell 1, continue with step 13.

13. Switch off and on the UE and ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

14. Repeat step 2-13 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Ncell 2” and “Re-select already detected Ncell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.24.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using conditions "Inband_Different" and “RRM-InterFreq”.

4.2.24.5 Test requirement

Tables 4.2.24.4.1-1, 4.2.24.5-1 and 4.2.24.5-2 defines the primary level settings including test tolerances for HD-FDD inter frequency cell re-selection test case.

Table 4.2.24.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter	Unit	nCell 1				nCell 2			
		T0	T1	T2	T3	T0	T1	T2	T3
$BW_{channel}$	kHz	180				180			
PRB location within eCell	-	30				35			
NPBCH_RA	dB	-3				-3			
NPBCH_RB	dB								
NPSS_RA	dB								
NSSS_RA	dB								
NPDCCH_RA	dB								
NPDCCH_RB	dB								
NPDSCH_RA	dB								
NPDSCH_RB	dB								
NOCNG_RA Note 1	dB								
NOCNG_RB Note 1	dB								
Qrxlevmin	dBm	-140				-140			
Pcompensation	dB	0				0			
$Qhyst_s$	dB	0				0			
$Qoffset_{s,n}$	dB	0				0			
Cell_selection_and_reselection_quality_measurement		NRSRP				NRSRP			
N_{oc}	dBm/15 kHz	Specified in Table A.4.2.24.1-3							
$\hat{E}_s / N_{oc}$	dB	10	-12	-12	-2.25	-infinity	-infinity	-2.25	-12
$\hat{E}_s / I_{ot}$ Note2	dB	10	-12	-12	-2.25	-infinity	-infinity	-2.25	-12
NRSRP Note2	dBm/15 kHz	-88	-110	-110	-100.25	-infinity	-infinity	-100.25	-110
Treselection	s	0				0			
Propagation Condition		AWGN				AWGN			
Antenna Configuration		2x1				2x1			
Timing offset to nCell 1	ms	0							

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.24.5-2: Cell 1 specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter	Unit	eCell 1			
		T0	T1	T2	T3
$BW_{channel}$	MHz	10			
OCNG Pattern	-	NOP.1 FDD			
PBCH_RA	dB	-3			
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
Qrxlevmin	dBm	-140			
Pcompensation	dB	0			
$Qhyst_s$	dB	0			
$Qoffset_{s,n}$	dB	0			
N_{oc}	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	3	3	3	3
Treselection	s	0			
Propagation Condition		AWGN			
Antenna Configuration		2x1			

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Ncell 2, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 2.

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Ncell 1, and starts to send preambles on the NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 1.

The cell re-selection delay to an already detected cell shall be less than 21.12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Inter\_EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_Inter\_EC} + T_{SI}$,

Where:

T_{detect,NB_Inter_EC} as specified in TS 36.133 [4] Table 4.6.2.6-1 in clause 4.6.2.6.

$T_{evaluate,\ NB\_Inter\_EC}$ as specified in TS 36.133 [4] Table 4.6.2.6-1 in clause 4.6.2.6.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 66.32 s, allow 67 s for the cell re-selection delay to a newly detectable cell and 21.12 s, and allow 22 s for the cell re-selection delay to an already detected cell in the test case.

4.2.25 E-UTRAN FDD – FDD Inter frequency case for CE UE in normal coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Test procedure and message content is still FFS.*
- *Minimum conformance requirement still have bracket remaining by RAN4.*
- *Annex E is pending to update*
- *TS36.521-2 applicability table is missing*

4.2.25.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.25.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE of category M1 and higher.

4.2.25.3 Minimum conformance requirements

The requirements in this subclause apply if UE is in the normal coverage area of the serving cell. The UE is considered to be in normal coverage area of serving cell according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot of the serving cell defined in Annex B.1.3 in TS36.133 [4] for a corresponding Band.

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided. The UE shall not cause any interruption to the paging reception and acquisition of SI while performing measurement on serving or any neighbour cells.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in clause 4.2.2 in TS36.133 [4].

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS36.304 [6] within $T_{detect,EUTRAN\_Inter\_NC}$, if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 7 dB for reselections based on ranking or 7 dB for RSRP reselections based on absolute priorities or 5 dB for RSRQ reselections based on absolute priorities. An inter frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex B.1.8 in TS36.133 [4] for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,E\text{-}UTRAN\_Inter\_NC}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP or RSRQ at least every $T_{measure,EUTRAN\_Inter\_NC}$ for identified lower or equal priority inter-frequency cells. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter\_NC}/2$.

The UE shall not consider a E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 [6] within $T_{evaluate,E\text{-}UTRAN\_Inter\_NC}$, when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least [7]dB for reselections based on ranking or [7]dB for RSRP reselections based on absolute priorities or [5]dB for RSRQ reselections based on absolute priorities.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter\_NC}$, $T_{measure,EUTRAN\_Inter\_NC}$ and $T_{evaluate,\ E\text{-}UTRAN\_Inter\_NC}$ are specified in Table 4.2.25.3-1.

Table 4.2.25.3-1: $T_{detect,EUTRAN\_Inter\_NC}$, $T_{measure,EUTRAN\_Inter\_NC}$ and $T_{evaluate,E\text{-}UTRAN\_Inter\_NC}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Inter\_NC}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter\_NC}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_Inter\_NC}$ [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

For higher priority cells, a UE may optionally use a shorter value for $T_{measure,EUTRAN\_Inter\_NC}$,which shall not be less than Max(0.64 s, one DRX cycle).

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.1.3 and A.4.2.25.

4.2.25.4 Test description

4.2.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.25.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 4.2.25.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.25.4.1-1: General test parameters for FD-FDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
PRACH configuration			PRACH_2CE	See Table in A.9-1.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.25.4.2 Test procedure

[TBD]

4.2.25.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

[TBD]

4.2.25.5 Test requirement

Tables 4.2.25.4.1-1 and 4.2.25.5-1 define the primary level settings including test tolerances for E-UTRAN FD-FDD inter frequency cell reselection test case for CE UE in normal coverage test.

Table 4.2.25.5-1: Cell specific test parameters for FD-FDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140+TT			-140+TT		
N_{oc} Note 2	dBm/15 kHz	-98+TT			-98+TT		
$\hat{E}_s / N_{oc}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
$\hat{E}_s / I_{ot}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
RSRP Note 3	dBm/15 KHz	-84+TT	-84+TT	-84+TT	-102+TT	-infinity	-86+TT
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority shall be less than 68 s.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 1.

The cell re-selection delay to lower priority shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateFDD,inter} + T_{SI}$, and to lower priority cell can be expressed as: $T_{evaluateFDD,inter} + T_{SI}$,

Where:

$T_{higher\_priority\_search}$ See clause 4.2.25.3

$T_{evaluate, E\text{-}UTRAN\_Inter\_NC}$ See Table 4.2.25.3-1 in clause 4.2.25.3

$T_{SI-EUTRA-M1-NC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

4.2.26 E-UTRAN HD – FDD Inter frequency case for CE UE in normal coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Test procedure and requirement is still FFS.*
- *Annex E is pending to update*
- *TS36.521-2 applicability table is missing*

4.2.26.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.26.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE of category M1 and higher.

4.2.26.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.25.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.1.3 and A.4.2.26.

4.2.26.4 Test description

4.2.26.4.1 Initial conditions

Same initial conditions as in clause 4.2.25.4.1 with the following exceptions:

- Instead of Table 4.2.25.4.1-1 → use Table 4.2.26.4.1-1.

Table 4.2.26.4.1-1: General test parameters for HD-FDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
PRACH configuration			PRACH_2CE	See table in A.9-1.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.26.4.2 Test procedure

[TBD]

4.2.26.4.3 Message contents

Same message contents as in clause 4.2.25.4.3.

4.2.26.5 Test requirement

Tables 4.2.26.4.1-1 and 4.2.26.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD inter frequency cell reselection test case for CE UE in normal coverage test.

Table 4.2.26.5-1: Cell specific test parameters for HD-FDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1		OP.6 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140+TT			-140+TT		
N_{oc} Note 2	dBm/15 kHz	-98+TT			-98+TT		
$\hat{E}_s / N_{oc}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
$\hat{E}_s / I_{ot}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
RSRP Note 3	dBm/15 KHz	-84+TT	-84+TT	-84+TT	-102 +TT	-infinity	-86+TT
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority shall be less than 68 s.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 1.

The cell re-selection delay to lower priority shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateFDD,inter} + T_{SI}$, and to lower priority cell can be expressed as: $T_{evaluateFDD,inter} + T_{SI}$,

Where:

$T_{higher\_priority\_search}$ See clause 4.2.25.3

$T_{evaluate, E\text{-}UTRAN\_Inter\_NC}$ See Table 4.2.25.3-1 in clause 4.2.25.3

$T_{SI-EUTRA-M1-NC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

4.2.27 E-UTRAN TDD – TDD Inter frequency case for CE UE in normal coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Test procedure and requirement is still FFS.*
- *Annex E is pending to update*
- *TS36.521-2 applicability table is missing*

4.2.27.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.27.2 Test applicability

This test applies to all types of E-UTRA TDD CE UE of category M1 and higher.

4.2.27.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.25.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.1.3 and A.4.2.27.

4.2.27.4 Test description

4.2.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.25.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 4.2.25.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.27.4.1-1: General test parameters for TDD-TDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
PRACH configuration			PRACH_2CE	See table in A.9-1.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-1 in TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.27.4.2 Test procedure

[TBD]

4.2.27.4.3 Message contents

Same message contents as in clause 4.2.25.4.3.

4.2.27.5 Test requirement

Tables 4.2.27.4.1-1 and 4.2.27.5-1 define the primary level settings including test tolerances for E-UTRAN TDD inter frequency cell reselection test case for CE UE in normal coverage test.

Table 4.2.27.5-1: Cell specific test parameters for TDD-TDD inter frequency cell reselection test case for CE UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140+TT			-140+TT		
N_{oc} Note 2	dBm/15 kHz	-98+TT			-98+TT		
$\hat{E}_s / N_{oc}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
$\hat{E}_s / I_{ot}$	dB	14+TT	14+TT	14+TT	-4+TT	-infinity	12+TT
RSRP Note 3	dBm/15 KHz	-84+TT	-84+TT	-84+TT	-102+TT	-infinity	-86+TT
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority shall be less than 68 s.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 1.

The cell re-selection delay to lower priority shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateFDD,inter} + T_{SI}$, and to lower priority cell can be expressed as: $T_{evaluateFDD,inter} + T_{SI}$,

Where:

$T_{higher\_priority\_search}$ See clause 4.2.25.3

$T_{evaluate, E\text{-}UTRAN\_Inter\_NC}$ See Table 4.2.25.3-1 in clause 4.2.25.3

$T_{SI-EUTRA-M1-NC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

4.2.28 E-UTRAN FDD – FDD Inter frequency case for CE UE in enhanced coverage

4.2.28.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell, in enhanced coverage the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.28.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE release 14 and forward, including both BL/CE and non-BL/CE UE. Applicability requires support CEModeB.

4.2.28.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The requirements in this subclause apply if UE is in the enhanced coverage area of the serving cell. The UE is considered to be in enhanced coverage area of serving cell according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot of the serving cell defined in Annex B.1.3 for a corresponding Band.

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided. The UE shall not cause any interruption to the paging reception and acquisition of SI while performing measurement on serving or any neighbor cells.

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in clause 4.2.2.

If Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS36.304 within $T_{detect,EUTRAN\_Inter\_EC}$, if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6 dB for reselections based on ranking. An inter frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex B.1.8 for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,E-UTRAN\_Inter\_EC.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP or RSRQ at least every $T_{measure,EUTRAN\_Inter\_EC}$ for identified lower or equal priority inter-frequency cells. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 4 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter\_EC}/2$.

The UE shall not consider a E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 within $T_{evaluate,E\text{-}UTRAN\_Inter\_EC}$, when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6 dB for reselections based on ranking.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter\_EC}$, $T_{measure,EUTRAN\_Inter\_EC}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter\_EC}$ are specified in Table 4.7.2.2.3-1. For UE configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter\_EC}$, $T_{measure,EUTRAN\_Inter\_EC}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter\_EC}$ are specified in Table 4.7.2.2.3-3. Additionally, the requirements in Table 4.7.2.2.3-3 apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detect,EUTRAN\_Inter\_EC}$, $T_{measure,EUTRAN\_Inter\_EC}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter\_EC}$ when multiple PTWs are used.

Table 4.2.28.3-1: $T_{detect,EUTRAN\_Inter\_EC}$, $T_{measure,EUTRAN\_Inter\_EC}$ and $T_{evaluate,E\text{-}UTRAN\_Inter\_EC}$

SCH Ês/Iot of neighboring cell: Q2 [dB]	DRX cycle length [s]	$T_{detect,EUTRAN\_Inter\_EC}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_inter\_EC}$ [s] (number of DRX cycles)
-15≤ Q2 < -6	0.32	330.24 (1032)	1.28 (4)	10.24 (32)
	0.64	330.24 (516)	1.28 (2)	10.24 (16)
	1.28	524.8 (410)	1.28 (1)	12.8 (10)
	2.56	1039.36 (406)	2.56 (1)	15.36 (6)
Q2≥-6	0.32	16.64 (52)	1.28 (4)	10.24 (32)
	0.64	23.04 (36)	1.28 (2)	10.24 (16)
	1.28	38.4 (30)	1.28 (1)	12.8 (10)
	2.56	66.56 (26)	2.56 (1)	15.36 (6)

For higher priority cells, a UE may optionally use a shorter value for $T_{measure,EUTRAN\_Inter\_EC}$,which shall not be less than Max(0.64 s, one DRX cycle).

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.2.3 and A.4.2.28.

4.2.28.4 Test description

4.2.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.93.
2. The general test parameter settings are set up according to Table 4.2.28.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 4.2.28.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.28.4.1-1: General test parameters for FD-FDD inter frequency cell reselection test case for Cat-M1 UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.9
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.28.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one of the E-UTRA FDD carriers. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. UE has not registered with network for the tracking area containing Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2”.

1. Ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.28.5.1-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires the SS shall switch the parameters according T2 in Table 4.2.28.5.1-1. T2 starts.

5. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.

6. If the UE responds on the newly detectable cell 2 within TBD seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.28.5.1-1.

9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the UE responds on the already detected cell, Cell 1 during time duration T3 within TBD seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the UE and ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A in Cell 1. Set the parameters according to duration T1 in Table 4.2.28.5.1-1.

13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.28.4.3 Message contents

Message contents are according to 3GPP TS 36.508 [7] clause 4.6 using condition "CEmodeB".

4.2.28.5 Test requirement

Tables 4.2.28.4.1-1 and 4.2.28.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.28.5-1: Cell specific test parameters for FD-FDD inter frequency cell reselection test case for UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10 for 10 MHz cell BW: 5 for 5 MHz cell BW			10 for 10 MHz cell BW: 5 for 5 MHz cell BW		
OCNG Patterns defined in A.3.2.1.6		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW			OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
$\hat{E}_s / I_{ot}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
RSRP Note 3	dBm/15 KHz	-103	-110	-102.5	-infinity	-102.5	-110
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 337 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 17 s.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Inter\_EC} + T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$,and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Inter\_EC} + T_{SI\_M1\_EC}$,

Where:

$T_{detect,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{evaluate,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 336.64 s, allow 337 s for the cell re-selection delay to a newly detectable cell and 16.64 s, allow 17 s for the cell re-selection delay to an already detected cell in the test case.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.29 E-UTRAN HD – FDD Inter frequency case for CE UE in enhanced coverage

4.2.29.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell, in enhanced coverage the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.29.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE release 14 and forward, including both BL/CE and non-BL/CE UE. Applicability requires support CEModeB.

4.2.29.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.2.3 and A.4.2.29.

4.2.29.4 Test description

4.2.29.4.1 Initial conditions

Same initial conditions as in clause 4.2.28.4.1 with the following exceptions:

- Instead of Table 4.2.28.4.1-1 → use Table 4.2.29.4.1-1.

Table 4.2.29.4.1-1: General test parameters for HD-FDD inter frequency cell reselection test case for UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.9
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.29.4.2 Test procedure

Same test procedure as in clause 4.2.28.4.2 with the following exceptions:

- Instead of Table 4.2.28.5.1-1 → use Table 4.2.29.5.1-1.

4.2.29.4.3 Message contents

Message contents are according to 3GPP TS 36.508 [7] clause 4.6 using condition "CEmodeB".

4.2.29.5 Test requirement

Tables 4.2.29.4.1-1 and 4.2.29.5-1 defines the primary level settings including test tolerances for E-UTRAN HD FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.29.5-1: Cell specific test parameters for HD-FDD inter frequency cell reselection test case for UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10 for 10 MHz cell BW: 5 for 5 MHz cell BW			10 for 10 MHz cell BW: 5 for 5 MHz cell BW		
OCNG Patterns defined in A.3.2.1.6		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW			OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
$\hat{E}_s / I_{ot}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
RSRP Note 3	dBm/15 KHz	-103	-110	-102.5	-infinity	-102.5	-110
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 337 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 17 s.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Inter\_EC} + T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$,and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Inter\_EC} + T_{SI\_M1\_EC}$,

Where:

$T_{detect,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{evaluate,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 336.64 s, allow 337 s for the cell re-selection delay to a newly detectable cell and 16.64 s, allow 17 s for the cell re-selection delay to an already detected cell in the test case.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.30 E-UTRAN TDD Inter frequency case for CE UE in enhanced coverage

4.2.30.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell, in enhanced coverage the CE UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.30.2 Test applicability

This test applies to all types of E-UTRA-FDD CE UE release 14 and forward, including both BL/CE and non-BL/CE UE. Applicability requires support CEModeB.

4.2.30.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.7.2.2.3 and A.4.2.30.

4.2.30.4 Test description

4.2.30.4.1 Initial conditions

Same initial conditions as in clause 4.2.28.4.1 with the following exceptions:

- Instead of Table 4.2.28.4.1-1 → use Table 4.2.30.4.1-1.

Table 4.2.30.4.1-1: General test parameters for TDD-TDD inter frequency cell reselection test case for CE UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-1 in TS 36.211
PRACH Parameters			PRACH_4CE	Refer to A.9
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.30.4.2 Test procedure

Same test procedure as in clause 4.2.28.4.2 with the following exceptions:

- Instead of Table 4.2.28.5.1-1 → use Table 4.2.30.5.1-1.

4.2.30.4.3 Message contents

Message contents are according to 3GPP TS 36.508 [7] clause 4.6 using condition "CEmodeB".

4.2.30.5 Test requirement

Tables 4.2.30.4.1-1 and 4.2.30.5-1 define the primary level settings including test tolerances for E-UTRAN TDD inter frequency cell reselection test case for CE UE in normal coverage test.

Table 4.2.30.5-1: Cell specific test parameters for TDD-TDD inter frequency cell reselection test case for CE UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10 for 10 MHz cell BW: 5 for 5 MHz cell BW			10 for 10 MHz cell BW: 5 for 5 MHz cell BW		
OCNG Patterns defined in A.3.2.1.6		OP.2 TDD for 10 MHz cell BW: OP.10 TDD for 5 MHz cell BW			OP.2 TDD for 10 MHz cell BW: OP.10 TDD for 5 MHz cell BW		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
$\hat{E}_s / I_{ot}$	dB	-5	-12	-4.5	-infinity	-4.5	-12
RSRP Note 3	dBm/15 KHz	-103	-110	-102.5	-infinity	-102.5	-110
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell shall be less than 337 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell shall be less than 17 s.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Inter\_EC} + T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$,and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Inter\_EC} + T_{SI\_M1\_EC}$,

Where:

$T_{detect,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{evaluate,EUTRAN\_Inter\_EC}$ See Table 4.7.2.2.3-1 in clause 4.7.2.2.3

$T_{SI\text{-}EUTRA\text{-}M1\text{-}EC}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 336.64 s, allow 337 s for the cell re-selection delay to a newly detectable cell and 16.64 s, allow 17 s for the cell re-selection delay to an already detected cell in the test case.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.31 E-UTRAN FDD – FDD Inter frequency case for UE Category 1bis

4.2.31.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the category 1bis UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.31.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

4.2.31.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search} = (60 * N_{layers})$ seconds, where the parameter N_{layers} is the total number of configured higher priority E-UTRA carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for lower or equal priority inter-frequency layers.

For UE category 1bis, if the UE is not configured with eDRX_IDLE cycle or configured with an eDRX_IDLE cycle not longer than 20.48 s, the UE shall be able to evaluate whether a newly detectable inter-frequency cell in normal performance group meets the reselection criteria defined in TS36.304 [6] within $K_{carrier,normal} * T_{detect,EUTRAN\_Inter}$, and able to evaluate whether a newly detectable inter-frequency cell in reduced performance group meets the reselection criteria defined in TS36.304 [6] within $6 * K_{carrier,reduced} * T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5.5dB for reselections based on ranking or 6.5dB for RSRP reselections based on absolute priorities or 5dB for RSRQ reselections based on absolute priorities. An inter-frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex B.1.2 for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,E\text{-}UTRAN\_Inter}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

If the UE is configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall measure RSRP or RSRQ at least every $K_{carrier,normal} * T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in normal performance group, and at least every $6 * K_{carrier,reduced} * T_{measure,EUTRAN\_Inter}$ for identified lower or equal priority inter-frequency cells in reduced performance group. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP or RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}/2$.

The UE shall not consider an E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

If the UE is configured with eDRX_IDLE cycle not longer than 20.48 s, for an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell in normal performance group has met reselection criterion defined TS 36.304 within $K_{carrier,normal} * T_{evaluate,E-UTRAN\_Inter}$, and capable of evaluating that the inter-frequency cell in reduced performance group has met reselection criterion defined TS 36.304 within $6 * K_{carrier,reduced} * T_{evaluate,E-UTRAN\_Inter}$, when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $T_{reselection}$ timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,\ E\text{-}UTRAN\_inter}$ are specified in Table 4.2.31.3-1.

Table 4.2.31.3-1: $T_{detect,EUTRAN\_Inter}$, $T_{measure,EUTRAN\_Inter}$ and $T_{evaluate,E\text{-}UTRAN\_Inter}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Inter}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_Inter}$ [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

For higher priority cells, a UE may optionally use a shorter value for $T_{measureE\text{-}UTRA\_Inter}$,which shall not be less than Max(0.64 s, one DRX cycle).

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.31.

4.2.31.4 Test description

4.2.31.4.1 Initial conditions

Same initial conditions as in clause 4.2.3.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

4.2.31.4.2 Test procedure

Same initial conditions as in clause 4.2.3.4.2 with the following exceptions:

- Instead of Table 4.2.3.5-1 → use Table 4.2.31.5-1.
- Instead of Table 4.2.3.5-2 → use Table 4.2.31.5-2.

4.2.31.4.3 Message contents

Same message contents as in clause 4.2.3.4.3.

4.2.31.5 Test requirement

Tables 4.2.3.4.1-1, 4.2.31.5-1 and 4.2.31.5-2 define the primary level settings including test tolerances for E-UTRAN FDD – FDD Inter frequency case for UE Category 1bis. Note that the time period for T0 is system implementation dependent.

Table 4.2.31.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	-140
N_{oc} Note 2	dBm/15 kHz	-99.85	-99.85
RSRP Note 3	dBm/15 KHz	-103.55	-86.45
$\hat{E}_s / I_{ot}$	dB	-3.7	15.4
$\hat{E}_s / N_{oc}$	dB	-3.7	15.4
$T_{reselectionEUTRAN}$	S	0	0
$S_{nonintrasearch}$	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.31.5-2: Cell specific test parameters for E-UTRAN FDD-FDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.85			-99.85		
RSRP Note 3	dBm/15 KHz	-82.45	-82.45	-82.45	-103.55	-infinity	-84.45
$\hat{E}_s / I_{ot}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$\hat{E}_s / N_{oc}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E-UTRAN\_Inter} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.32 E-UTRAN FDD – TDD Inter frequency case for UE Category 1bis

4.2.32.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and mode, compared to the current cell the category 1bis UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.32.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 13 and forward of UE category 1bis.

4.2.32.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.31.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.32.

4.2.32.4 Test description

4.2.32.4.1 Initial conditions

Same initial conditions as in clause 4.2.4.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

4.2.32.4.2 Test procedure

Same initial conditions as in clause 4.2.4.4.2 with the following exceptions:

- Instead of Table 4.2.4.5-1 → use Table 4.2.32.5-1.
- Instead of Table 4.2.4.5-2 → use Table 4.2.32.5-2.

4.2.32.4.3 Message contents

Same message contents as in clause 4.2.4.4.3.

4.2.32.5 Test requirement

Tables 4.2.4.4.1-1, 4.2.32.5-1 and 4.2.32.5-2 define the primary level settings including test tolerances for E-UTRAN FDD – TDD Inter frequency case for UE Category 1bis. Note that the time period for T0 is system implementation dependent.

Table 4.2.32.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-TDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 FDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	-140
N_{oc} Note 2	dBm/15 kHz	-99.85	-99.85
RSRP Note 3	dBm/15 KHz	-103.55	-86.45
$\hat{E}_s / I_{ot}$	dB	-3.7	15.4
$\hat{E}_s / N_{oc}$	dB	-3.7	15.4
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.32.5-2: Cell specific test parameters for E-UTRAN FDD-TDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 FDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.85			-99.85		
RSRP Note 3	dBm/15 KHz	-82.45	-82.45	-82.45	-103.55	-infinity	-84.45
$\hat{E}_s/I_{ot}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$\hat{E}_s/N_{oc}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Antenna Configuration		1x1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E-UTRAN\_Inter} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search} + T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.33 E-UTRAN TDD – FDD Inter frequency case for UE Category 1bis

4.2.33.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency and mode, compared to the current cell the category 1bis UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.33.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 13 and forward of UE category 1bis.

4.2.33.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.31.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.33.

4.2.33.4 Test description

4.2.33.4.1 Initial conditions

Same initial conditions as in clause 4.2.5.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

4.2.33.4.2 Test procedure

Same initial conditions as in clause 4.2.5.4.2 with the following exceptions:

- Instead of Table 4.2.5.5-1 → use Table 4.2.33.5-1.
- Instead of Table 4.2.5.5-2 → use Table 4.2.33.5-2.

4.2.33.4.3 Message contents

Same message contents as in clause 4.2.5.4.3.

4.2.33.5 Test requirement

Tables 4.2.5.4.1-1, 4.2.33.5-1 and 4.2.33.5-2 define the primary level settings including test tolerances for E-UTRAN TDD – FDD Inter frequency case for UE Category 1bis. Note that the time period for T0 is system implementation dependent.

Table 4.2.33.5-1: Cell Specific Test requirement Parameters for TDD-FDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 FDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	-140
N_{oc} Note 2	dBm/15 kHz	-99.85	-99.85
RSRP Note 3	dBm/15 KHz	-103.55	-86.45
$\hat{E}_s / I_{ot}$	dB	-3.7	15.4
$\hat{E}_s / N_{oc}$	dB	-3.7	15.4
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.33.5-2: Cell specific test parameters for TDD-FDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.85			-99.85		
RSRP Note 3	dBm/15 KHz	-82.45	-82.45	-82.45	-103.55	-infinity	-84.45
$\hat{E}_s/I_{ot}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$\hat{E}_s/N_{oc}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Antenna Configuration		1x1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E-UTRAN\_Inter} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search} + T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.34 E-UTRAN TDD – TDD Inter frequency case for UE Category 1bis

4.2.34.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the category 1bis UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.34.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

4.2.34.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.31.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.34.

4.2.34.4 Test description

4.2.34.4.1 Initial conditions

Same initial conditions as in clause 4.2.6.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

4.2.34.4.2 Test procedure

Same initial conditions as in clause 4.2.6.4.2 with the following exceptions:

- Instead of Table 4.2.6.5-1 → use Table 4.2.34.5-1.
- Instead of Table 4.2.6.5-2 → use Table 4.2.34.5-2.

4.2.34.4.3 Message contents

Same message contents as in clause 4.2.6.4.3.

4.2.34.5 Test requirement

Tables 4.2.6.4.1-1, 4.2.34.5-1 and 4.2.34.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Inter frequency case for UE Category 1bis. Note that the time period for T0 is system implementation dependent.

Table 4.2.34.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	-140
N_{oc} Note 2	dBm/15 kHz	-99.85	-99.85
RSRP Note 3	dBm/15 KHz	-103.55	-86.45
$\hat{E}_s / I_{ot}$	dB	-3.7	15.4
$\hat{E}_s / N_{oc}$	dB	-3.7	15.4
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.34.5-2: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD Inter frequency case for UE Category 1bis in AWGN

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in A.3.2.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.85			-99.85		
RSRP Note 3	dBm/15 KHz	-82.45	-82.45	-82.45	-103.55	-infinity	-84.45
$\hat{E}_s / I_{ot}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$\hat{E}_s / N_{oc}$	dB	17.4	17.4	17.4	-3.7	-infinity	15.4
$Treselection_{EUTRAN}$	S	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Antenna Configuration		1x1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search} + T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.35 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage

4.2.35.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the Cat-NB1 UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.35.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher.

4.2.35.3 Minimum conformance requirements

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$.

The UE shall be able to identify new intra-frequency cells and perform NRSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 within T_{detect,NB_Intra_NC} when Treselection= 0. An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_NC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter NRSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Intra\text{-}NC/2.}$

The UE shall not consider an NB-IoT neighbour cell in cell reselection if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [6] within $T_{evaluate,NB\_intra\text{-}NC}$ when $T_{reselection}$ = 0, provided that the cell is at least XdB better ranked, where 'X' is specified in Table 4.6.2.4-3. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

If $T_{reselection}$ timer has a non-zero value and the intra-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, T_{detect,NB_Intra_NC}, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,\ NB\_intra\_NC}$ are specified in Table 4.2.35.3-1. For UE configured with eDRX_IDLE cycle, $T_{detect,NB\_Intra\ -NC}$, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,\ NB\_intra-NC}$ are specified in Table 4.2.35.3-2, where the requirements apply provided that the serving NB-IoT cell is configured with eDRX_IDLE and is the same in all PTWs during any of T_{detect,NB_Intra_NC}, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,\ NB\_intra\_NC}$ when multiple PTWs are used.

Table 4.2.35.3-1: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$, $T_{measure,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ and $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC}$

DRX cycle length [s]	T_{detect,NB_Intra_NC} [s] (number of DRX cycles)	$T_{measure,NB\_Intra\_NB\_NC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_intra\_NB\_NC}$ [s] (number of DRX cycles)
1.28	51 (40)	1.28 (1)	6.5 (5)
2.56	51 (20)	2.56 (1)	7.68 (3)
5.12	102 (20)	5.12 (1)	10.24 (2)
10.24	102 (10)	10.24 (1)	20.48 (2)

Table 4.2.35.3-2: T_{detect,NB_Intra_NC}, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,NB\_intra\_NC}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 2.56s periods)	$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ [s] (number of DRX cycles)	$T_{measure,NB\_Intra\_NC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_intra\_NC}$ [s] (number of DRX cycles)
20.48 ≤ eDRX_IDLE cycle length ≤ 10485.76	1.28	≥ 5.12 (2)	$eDRX\_cycle\_length \times \left\lceil \frac{20}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$ (20)	1.28 (1)	2.56 (2)
	2.56	≥ 7.68 (3)		2.56 (1)	5.12 (2)
	5.12	≥ 12.8 (5)		5.12 (1)	10.24 (2)
	10.24	≥ 23.04] (9)		10.24 (1)	20.48 (2)
NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs. NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section X of TS 24.008 [34].					

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

If all the relaxed monitoring criteria defined in clause 5.2.4.12 [6] are fulfilled then the UE's intra-frequency measurement is not required to meet T_{detect,NB_Intra_NC}, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,NB\_intra\_NC}$ as defined in Table 4.2.35.3-1 and Table 4.2.35.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2.2 and A.4.2.35.

4.2.35.4 Test description

4.2.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 4.2.35.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.

2. The parameter settings for the cells are set up according to Table 4.2.35.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There are one NB-IoT carrier and one E-UTRA carrier and four cells specified in the test. Ncell1 is inband cell to Cell1 and Ncell2 is inband cell to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.35.4.1-1: General test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Cell2, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Cell2, Ncell1	
Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell1 and Cell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
NPRACH Configuration			NPRACH.R-2	As specified in A.10.3
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	60	T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to Ncell2 (within T2) T3 starts
T3		s	15	T3 is defined so that cell re-selection time is taken into account.

4.2.35.4.2 Test procedure

Same test procedure as specified in clause 4.2.18.4.2 with following exceptions:

Instead of table 4.2.18.5-1 → use Table 4.2.35.5-1.

Instead of table 4.2.18.5-2 → use Table 4.2.35.5-2.

4.2.35.4.3 Message contents

Same message contens as specified in clause 4.2.18.4.3.

4.2.35.5 Test requirement

Tables 4.2.35.5-1 and 4.2.35.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage.

Table 4.2.35.5-1: Ncell 1, Ncell 2 specific test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	180			180		
PRB location within eCell	-	eCell 1 $BW_{channel}$ 10MHz: 30			eCell 2 $BW_{channel}$ 10MHz: 30		
NPBCH_RA	dB	-3			-3		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_ reselection_quality_measurement		NRSRP			NRSRP		
N_{oc}	dBm/15 kHz	Specified in Table 4.2.35.1-2					
$\hat{E}_s / N_{oc}$	dB	17	13	17.45	-infinity	17.45	13
$\hat{E}_s / I_{ot}$ Note2	dB	17	-4.53	4.24	-infinity	4.24	-4.53
NRSRP Note2	dBm/15 kHz	-81	-85	-80.55	-infinity	-80.55	-85
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to nCell 1	□s	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.35.5-2: eCell 1 and eCell2 specific test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	10			10		
NOCNG Pattern defined in clause D.3	-	$BW_{channel}$ 10MHz: NOP.1 TDD			$BW_{channel}$ 10MHz: NOP.1 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$ Note2	dBm	3	3	3	3	3	3
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to eCell 1	□s	-			3		

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Ncell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 2.

The cell re-selection delay to a newly detectable cell shall be less than 59.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Ncell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Ncell 1.

The cell re-selection delay to an already detected cell shall be less than 14.82 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$,

Where:

$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ See Table 4.6.2.2-1 in clause 4.6.2.2

$T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC}$ See Table 4.6.2.2-1 in clause 4.6.2.2

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 59.32 s, allow 60 s for the cell re-selection delay to a newly detectable cell and 14.82 s, allow 15 s for the cell re-selection delay to an already detected cell in the test case.

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.36 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Test procedure and message content is still FFS.*
- *Minimum conformance requirement still have bracket remaining by RAN4.*
- *Annex E is pending to update*
- *TS36.521-2 applicability table is missing*

4.2.36.1 Test purpose

To verify the requirement for the TDD intra frequency cell reselection requirements for Cat-NB1 UE.

4.2.36.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher.

4.2.36.3 Minimum conformance requirements

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$.

The UE shall be able to identify new intra-frequency cells and perform NRSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 within T_{detect,NB_Intra_EC} when that Treselection= 0. An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_EC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter NRSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Intra\_EC}/2$

The UE shall not consider a NB-IoT neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [6] within $T_{evaluate,NB\_intra\_EC}$ when $T_{reselection} = 0$, provided that the cell is at least XdB better ranked, where 'X' is specified in Table 4.2.36.3-3. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

If $T_{reselection}$ timer has a non-zero value and the intra-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,\ NB\_intra\_EC}$ are specified in Table 4.2.36.3-1. For UE configured with eDRX_IDLE cycle, T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,\ NB\_intra\_EC}$ are specified in Table 4.2.36.3-2, where the requirements apply provided that the serving NB-IoT cell is configured with eDRX_IDLE and is the same in all PTWs during any of T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,\ NB\_intra\_EC}$ when multiple PTWs are used.

Table 4.2.36.3-1 : T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,\ NB\_intra\_EC}$

SCH Ês/Iot of neighbouring cell: Q2	DRX cycle length [s]	T_{detect,NB_Intra_EC} [s] (number of DRX cycles)	$T_{measure,NB\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_intra\_EC}$ [s] (number of DRX cycles)
-15≤ Q2 < -6	1.28	532 (415)	1.28 (1)	12.8 (10)
	2.56	532 (208)	2.56 (1)	15.36 (6)
	5.12	1063 (208)	5.12 (1)	20.48 (4)
	10.24	1063 (104)	10.24 (1)	30.72 (3)
Q2≥-6	1.28	58 (45)	1.28 (1)	12.8 (10)
	2.56	59 (23)	2.56 (1)	15.36 (6)
	5.12	113 (22)	5.12 (1)	20.48 (4)
	10.24	113 (11)	10.24 (1)	30.72 (3)

Table 4.2.36.3-2: T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,NB\_intra\_EC}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 2.56s periods)	T_{detect,NB_Intra_EC} [s] (number of DRX cycles)	$T_{measure,NB\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_intraEC}$ [s] (number of DRX cycles)
20.48 ≤ eDRX_IDLE cycle length ≤ 10485.76	1.28	≥15.36 (6)	$eDRX\_cycle\_length \times \left\lceil \frac{[406]}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$ (406)	1.28 (1)	12.8 (10)
	2.56	≥17.92 (7)		2.56 (1)	15.36 (6)
	5.12	≥23.04 (9)		5.12 (1)	20.48 (4)
	10.24	≥33.28 (13)		10.24 (1)	30.72 (3)
NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs. NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section X of TS 24.008 [34].					

Table 4.2.36.3-3: Conditions on NSCH Ês/Iot of identified and of the neighbour cell

NSCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell NSCH Ês/Iot: Q2	Cell Reselection Margin 'X'
-15≤Q1<-6	-15≤ Q2 < -6	8.3
-15≤Q1<-6	Q2□-6	8.3
Q1□ -6	Q2□-6	4

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

If all the relaxed monitoring criteria defined in clause 5.2.4.12 [6] are fulfilled then the UE's intra-frequency measurement is not required to meet T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,NB\_intra\_EC}$ as defined in Table 4.2.36.3-1 and Table 4.2.36.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2.4 and A.4.2.36.

4.2.36.4 Test description

4.2.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 4.2.36.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.
2. The parameter settings for the cells are set up according to Table 4.2.36.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There are one NB-IoT carrier and one E-UTRA carrier and four cells specified in the test. Ncell1 is inband cell to Cell1 and Ncell2 is inband cell to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.36.4.1-1: General test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Cell2, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Cell2, Ncell1	
Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell1 and Cell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
c			NPRACH.R-2	Refer to A.10.3
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	67	T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to Ncell2 (within T2) T3 starts
T3		s	22	T3 is defined so that cell re-selection time is taken into account.

4.2.36.4.2 Test procedure

Same test procedure as specified in clause 4.2.19.4.2 with following exceptions:

Instead of table 4.2.19.5-1 → use Table 4.2.36.5-1.

Instead of table 4.2.19.5-2 → use Table 4.2.36.5-2

4.2.36.4.3 Message contents

Same message contens as specified in clause 4.2.19.4.3.

4.2.36.5 Test requirement

Tables 4.2.36.5-1 and 4.2.36.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage.

Table 4.2.36.5-1: Ncell 1, Ncell 2 specific test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

		Ncell 1			Ncell 2		
		T1	**T2**	**T3**	**T1**	**T2**	**T3**
$BW_{channel}$	kHz	180			180		
PRB location within eCell	-	eCell 1 $BW_{channel}$ 10MHz: 30			eCell 2 $BW_{channel}$ 10MHz: 30		
NPBCH_RA	dB	-3			-3		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-156	-156	-156	-156	-156	-156
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_ reselection_quality_measurement		NRSRP			NRSRP		
	dBm/15 kHz	Specified in Table 4.2.36.5-2					
	dB	-9	-9	-0.25	-infinity	-0.25	-9
Note2	dB	-9	-11.89	-0.76	-infinity	-0.76	-11.89
NRSRP Note2	dBm/15 kHz	-107	-107	-98.25	-infinity	-98.25	-107
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to nCell 1	ms	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.36.5-2: Cell 1 and Cell2 specific test parameters for TDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	10			10		
NOCNG Pattern	-	$BW_{channel}$ 10MHz: NOP.1 TDD			$BW_{channel}$ 10MHz: NOP.1 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Note2	dBm/15 kHz	-98			-98		
Note2	dBm	3	3	3	3	3	3
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to eCell 1	ms	-			3		

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on nCell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 2.

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on nCell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 1.

The cell re-selection delay to an already detected cell shall be less than 21.12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC} + T_{SI}$,

Where:

$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}EC}$ See TS 36.133 [4] Table 4.6.2.4-1 in clause 4.6.2.4

$T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}EC}$ See TS 36.133 [4] Table 4.6.2.4-1 in clause 4.6.2.4

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32s is assumed in this test case.

This gives a total of 66.32 s, allow 67 s for the cell re-selection delay to a newly detectable cell and 21.12s, allow 22s for the cell re-selection delay to an already detected cell in the test case.

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.37 E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage

4.2.37.1 Test purpose

To verify the requirement for the TDD intra frequency cell reselection requirements for Cat-NB1 UE.

4.2.37.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher.

4.2.37.3 Minimum conformance requirements

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Inter\_EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_Inter\_EC} + T_{SI}$.

The UE shall be able to identify new inter-frequency cells and perform NRSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving NB-IoT cell, even if no explicit neighbour list with physical layer cell identities is provided.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS 36.304 within $P_{carrier} * T_{detect,NB\_Inter\_EC}$. An inter-frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in Annex B.1.5 for a corresponding Band.

The UE shall not cause any interruption to the paging reception and acquisition of SI while performing measurement on serving or any neighbour cells.

The UE shall filter NRSRP measurements of each measured inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Inter\_NB\text{-}IoT\_EC}/2$.

If an inter-frequency cell has been already detected but that has not been reselected to the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 within $P_{carrier} * T_{evaluate,NB\_Inter\_EC}$. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and inter-frequency NB-IoT cells.

If $T_{reselection}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this inter-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For a UE not configured with eDRX_IDLE cycle, $T_{detect,NB\_Inter\_EC,}$ $T_{measure,NB\_Inter\_EC}$ and $T_{evaluate,\ NB\_inter\_EC}$ are specified in Table 4.2.37.3-1. For UE configured with eDRX_IDLE cycle, $T_{detect,NB\_Inter\_EC,}$ $T_{measure,NB\_Inter\_EC}$ and $T_{evaluate,\ NB\_inter\_EC}$ are specified in Table 4.2.37.3-2 for the UE in enhanced coverage, where the requirements apply provided that the serving NB-IoT cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detect,NB\_Inter\_EC,}$ $T_{measure,NB\_Inter\_EC}$ and $T_{evaluate,\ NB\_inter\_EC}$ when multiple PTWs are used.

Table 4.2.37.3-1: T_{detect,NB_Inter_EC}, $T_{measure,NB\_Inter\_EC}$ and $T_{evaluate,NB\_Inter\_EC}$

SCH Ês/Iot of neighboring cell: Q2	DRX cycle length [s]	T_{detect,NB_Inter_EC} [s] (number of DRX cycles)	$T_{measure,NB\_Inter\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_Inter\_EC}$ [s] (number of DRX cycles)
-15≤ Q2 < -6	0.32	256 (800)	1.28 (4)	10.24 (32)
	0.64	266 (415)	1.28 (2)	10.24 (16)
	1.28	532 (415)	1.28 (1)	12.8 (10)
	2.56	532 (208)	2.56 (1)	15.36 (6)
	5.12	1063 (208)	5.12 (1)	20.48 (4)
	10.24	1063 (104)	10.24 (1)	30.72 (3)
Q2≥-6	0.32	26 (80)	1.28 (4)	10.24 (32)
	0.64	29 (45)	1.28 (2)	10.24 (16)
	1.28	58 (45)	1.28 (1)	12.8 (10)
	2.56	59 (23)	2.56 (1)	15.36 (6)
	5.12	113 (22)	5.12 (1)	20.48 (4)
	10.24	113 (11)	10.24 (1)	30.72 (3)

Table 4.2.37.3-2: T_{detect,NB_Inter_EC}, $T_{measure,NB\_Inter\_EC}$ and $T_{evaluate,\ NB\_inter\_EC}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 2.56s periods)	T_{detect,NB_Inter_EC} [s] (number of DRX cycles)	$T_{measure,NB\_Inter\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,NB}$ [s] (numb DRX cy
20.48 ≤ eDRX_IDLE cycle length ≤ 10485.76	0.32	≥12.8 (5)	$eDRX\_cycle\_length \times \left\lceil \frac{[406]}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$ ([406])	0.32 (1)	10.24
	0.64	≥12.8 (5)		0.64 (1)	10.24
	1.28	≥15.36 (6)		1.28 (1)	12.8
	2.56	≥17.92 (7)		2.56 (1)	15.36
	5.12	≥23.04 (9)		5.12 (1)	20.48
	10.24	≥33.28 (13)		10.24 (1)	30.72
NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.					
NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section X of TS 24.008 [34].					

Table 4.2.37.3-3: Conditions on NSCH Ês/Iot of identified and of the neighbour cell

NSCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell NSCH Ês/Iot: Q2	Cell Reselection Margin 'Y'
-15≤Q1<-6	-15≤ Q2 < -6	9.3
-15≤Q1<-6	Q2≥-6	9.3
Q1≥ -6	Q2≥-6	5

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

If all the relaxed monitoring criteria defined in clause 5.2.4.12 [6] are fulfilled then the UE's inter-frequency measurement is not required to meet T_{detect,NB_Intra_EC}, $T_{measure,NB\_Intra\_EC}$ and $T_{evaluate,NB\_intra\_EC}$ as defined in Table 4.2.37.3-1 and Table 4.2.37.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2.6 and A.4.2.37.

4.2.37.4 Test description

4.2.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 4.2.37.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.
2. The parameter settings for the cells are set up according to Table 4.2.37.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There are one NB-IoT carrier and one E-UTRA carrier and four cells specified in the test. Ncell1 is inband cell to Cell1 and Ncell2 is inband cell to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.37.4.1-1: General test parameters for TDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Ncell1	
Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
NPRACH Configuration			NPRACH.R-2	Refer to A.10.3
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	67	T2 is defined so that cell re-selection time is taken into account.
T3		s	22	T3 is defined so that cell re-selection time is taken into account.

4.2.37.4.2 Test procedure

Same test procedure as specified in clause 4.2.24.4.2 with following exceptions:

Instead of table 4.2.24.5-1 → use Table 4.2.35.5-1.

Instead of table 4.2.24.5-2 → use Table 4.2.35.5-2

4.2.37.4.3 Message contents

Same message contens as specified in clause 4.2.24.4.3.

4.2.37.5 Test requirement

Tables 4.2.37.5-1 and 4.2.37.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage.

Table 4.2.37.5-1: Ncell 1, Ncell 2 specific test parameters for TDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

		Ncell 1			Ncell 2		
		T1	**T2**	**T3**	**T1**	**T2**	**T3**
$BW_{channel}$	kHz	180			180		
PRB location within eCell	-	eCell 1 $BW_{channel}$ 10MHz: 30			eCell 1 $BW_{channel}$ 10MHz: 35		
NPBCH_RA	dB	-3			-3		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s,n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		NRSRP			NRSRP		
	dBm/15 kHz	Specified in Table A.4.2.37.1-3					
	dB	-12	-12	-2.25	-infinity	-2.25	-12
Note2	dB	-12	-12	-2.25	-infinity	-2.25	-12
NRSRP Note2	dBm/15 kHz	-110	-110	-100.25	-infinity	-100.25	-110
Treselection	s	0			0		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to nCell 1	ms	0					

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.37.5-2: Cell 1 specific test parameters for TDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

		Cell 1		
		T1	T2	T3
$BW_{channel}$	MHz	10		
OCNG Pattern	-	$BW_{channel}$ 10MHz: NOP.1 TDD		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qrxlevmin	dBm	-140		
Pcompensation	dB	0		
$Qhyst_s$	dB	0		
$Qoffset_{s,n}$	dB	0		
	dBm/15 kHz	-98		
	dB	3	3	3
Treselection	s	0		
Propagation Condition		AWGN		
Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power.

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on nCell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 2.

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on nCell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 1.

The cell re-selection delay to an already detected cell shall be less than 21.12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Inter\_EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_Inter\_EC} + T_{SI}$,

Where:

T_{detect,NB_Inter_EC} See Table 4.6.2.6-1 in clause 4.6.2.6

$T_{evaluate,\ NB\_Inter\_EC}$ See Table 4.6.2.6-1 in clause 4.6.2.6

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 66.32 s, allow 67 s for the cell re-selection delay to a newly detectable cell and 21.12 s, allow 22 s for the cell re-selection delay to an already detected cell in the test case.

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.2.38 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage with serving cell RRM measurement relaxation

4.2.38.1 Test purpose

To verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE.

4.2.38.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 15 and forward of UE Category NB1 and higher.

4.2.38.3 Minimum conformance requirements

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{evaluate,\ serv\_NB\text{-}NC} + T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$.

<TS 36.133 4.6.2.1>

The UE shall measure the NRSRP and NRSRQ level of the serving NB-IoT cell and evaluate the cell selection criterion S defined in [1] for the serving NB-IoT cell at least every DRX cycle.

The UE shall filter the NRSRP and NRSRQ measurements of the NB-IoT serving cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least DRX cycle/2.

If the UE is not configured with eDRX_IDLE cycle and has evaluated according to Table 4.2.38.3-1 in $N_{serv\_NB\text{-}IoT\text{-}NC}$ consecutive DRX cycles that the serving NB-IoT cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving NB-IoT cell, regardless of the measurement rules currently limiting UE measurement activities.

…

Table 4.2.38.3-1: $N_{serv\_NB\text{-}NC}$

DRX cycle length [s]	$N_{serv\_NB\text{-}IoT\text{-}NC}$ [number of DRX cycles]
1.28	2
2.56	2
5.12	2
10.24	2

<TS 36.133 4.6.2.1A>

The UE which supports *wakeUpSignal* [2] shall meet the requirement defined for the DRX cycle length of N*DRX_cycle in 4.6.2.1 in TS 36.133 [4], provided the following conditions are met:

- WUS has been configured in the serving NB-IoT cell using *WUS-Config-NB-r15* [2], and
- The serving cell measurement relaxation is signalled as ***n*** by the network using *numDRX-CycleRelaxed-r15*, and
- Serving cell S criteria is met with at least 2 dB margin.
- the relaxed monitoring criteria for neighbour cells in TS 36.304 [1] clause 5.2.4.12.1 is fulfilled, and

, where the relaxation factor N is given by Table 4.2.38.3-2. Otherwise the requirements defined for the configured DRX cycle length in Section 4.6.2.1 in TS 36.133 [4] shall apply.

Table 4.2.38.3-2: The relaxation factor N for a UE not configured with eDRX IDLE cycle

DRX cycle length [s]	Value
1.28	Min(***n*** , 8)
2.56	Min(***n*** , 4)
5.12	Min(***n*** , 2)
10.24	1
NOTE: ***n*** is signalled by the network by using *numDRX-CycleRelaxed-r15* defined in TS 36.331 [2].	

<TS 36.133 4.6.2.2>

The UE shall be able to identify new intra-frequency cells and perform NRSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 within T_{detect,NB_Intra_NC} when Treselection= 0. An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_NC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter NRSRP measurements of each measured intra-frequency cell using at least [2] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,NB\_Intra\text{-}NC}/2$

The UE shall not consider an NB-IoT neighbour cell in cell reselection if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [1] within $T_{evaluate,NB\_intra\text{-}NC}$ when $T_{reselection}$ = 0, provided that the cell is at least XdB better ranked, where 'X' is specified in Table 4.6.2.4-3. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

If $T_{reselection}$ timer has a non-zero value and the intra-frequency cell is better ranked than the serving NB-IoT cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, T_{detect,NB_Intra_NC}, $T_{measure,NB\_Intra\_NC}$ and $T_{evaluate,\ NB\_intra\_NC}$ are specified in Table 4.2.38.3-3.

Table 4.2.38.3-3: $T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$, $T_{measure,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ and $T_{evaluate,\ NB\_intra\_NB\text{-}IoT\text{-}NC}$

DRX cycle length [s]	T_{detect,NB_Intra_NC} [s] (number of DRX cycles)	$T_{measure,NB\_Intra\_NB\_NC}$ [s] (number of DRX cycles)	$T_{evaluate,NB\_intra\_NB\_NC}$ [s] (number of DRX cycles)
1.28	51 (40)	1.28 (1)	6.5 (5)
2.56	51 (20)	2.56 (1)	7.68 (3)
5.12	102 (20)	5.12 (1)	10.24 (2)
10.24	102 (10)	10.24 (1)	20.48 (2)

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2.1, 4.6.2.1A, 4.6.2.2 and A.4.2.38.

4.2.38.4 Test description

4.2.38.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 4.2.38.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.93.

2. The parameter settings for the cells are set up according to Table 4.2.38.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There are one NB-IoT carrier and one E-UTRA carrier and four cells specified in the test. Ncell1 is inband cell to Cell1 and Ncell2 is inband cell to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.38.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		nCell1	
	Neighbour cells		eCell1, eCell2, nCell2	
T2 end condition	Active cell		nCell2	
	Neighbour cells		eCell1, eCell2, nCell1	
Final condition	Visited cell		nCell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell1 and eCell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
NPRACH Configuration			NPRACH.R-1	Refer to A.10.3
$S_{SearchDeltaP}$		dB	6	Threshold for relaxed monitoring criterion as specified in 5.2.4.12.1 in [1]
Rmax			[128]	
maxDurationFactor			[one4th]	WUS config. Wmax = 32 (=1/4*Rmax)
numPOs			[n1]	WUS config. Single PO mapped to each WUS occasion
timeOffsetDRX			[ms40]	WUS config. Gap between the end of WUS duration to the associated PO
numDRX-CycleRelaxed			[4]	Serving cell RRM measurement is relaxed by
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>[30]	During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2
T2		s	[70]	T2 is defined so that cell re-selection time is taken into account.

4.2.38.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with two LTE Cells and one NB-IoT carrier with 2 Ncells of different physical cell ID. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Only Ncell1 is already identified by the UE prior to the start of the test, i.e. Ncell 2 is not identified. Ncell 1 and Ncell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Ncell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on NPRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 8.1.5A.5”

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

2. Set the parameters according to T1 in Table 4.2.38.5-1 and 4.2.38.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. Wait for 5mins so that the relaxed monitoring criteria for neighbour cells in TS 36.304 [1] clause 5.2.4.12.1 is fulfilled. T1 starts.

4. Set eCell 2 physical cell identity = ((current eCell 2 physical cell identity + 1) mod 14 + 2) and Ncell2 physical cell identity = ((current Ncell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

If:

- (PCID of NCELL2) mod 6 = (PCID of ECELL2) mod 6

- PCID of NCELL1 ≠ PCID of NCELL2

Continue with Step 5. Else repeat Step 4.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.38.5-1 and 4.2.38.5-2.

6. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Ncell 2.

7. If the UE responds on the newly detectable cell, Ncell 2, during time duration T2 within 70 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Ncell 2”. Otherwise count a fail for the event “Re-select newly detected Ncell 2”.

8. If the UE has re-selected Ncell 2 within T2, after the re-selection or when T2 expires, continue with step 10. Otherwise, if T2 expires and the UE has not yet re-selected Ncell 2, skip to step 9.

9. Switch off and on the UE and ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.2.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 4.2.38.4.3-1: SystemInformationBlockType4: HD-FDD Intra frequency cell reselection for Category NB1 UE for Ncell 2

Derivation Path: TS 36.508 [7] clause 8.1.4.3.3, Table 8.1.4.3.3-3: SystemInformationBlockType4-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList-r13 SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {}			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Ncell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

Table 4.2.38.4.3-2: *SystemInformationBlockType22-NB*: HD-FDD Intra frequency cell reselection for Category NB1 UE for Ncell 1

Derivation Path: TS 36.508 [7] clause 8.1.4.3.3, Table 8.1.4.3.3-8: SystemInformationBlockType22-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType22-NB-r14 ::= SEQUENCE {			
dl-ConfigList-r14 SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF DL-ConfigCommon-NB-r14 SEQUENCE {			
DL-ConfigCommon-NB-r14[1] SEQUENCE {			
wus-Config-r15 SEQUENCE {			
maxDurationFactor-r15 SEQUENCE {			
maxDurationFactor-r15	one4th		
}			
numPOs-r15	n1		
numDRX-CyclesRelaxed-r15	4		
timeOffsetDRX-r15	ms40		
timeOffset-eDRX-Short-r15	ms240		
timeOffset-eDRX-Long-r15	Not present		
}			
}			
}			
}			

4.2.38.5 Test requirement

Tables 4.2.38.5-1 and 4.2.38.5-2 defines the primary level settings including test tolerances for E-UTRAN HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage.

Table 4.2.38.5-1: nCell 1, nCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	nCell 1		nCell 2	
		T1	T2	T1	T2

$BW_{channel}$	kHz	180		180	
PRB location within eCell	-	eCell 1 $BW_{channel}$ 5MHz: 18 eCell 1 $BW_{channel}$ 10MHz: 30		eCell 2 $BW_{channel}$ 5MHz: 18 eCell 2 $BW_{channel}$ 10MHz: 30	
NPBCH_RA	dB	-3		-3	
NPBCH_RB	dB				
NPSS_RA	dB				
NSSS_RA	dB				
NPDCCH_RA	dB				
NPDCCH_RB	dB				
NPDSCH_RA	dB				
NPDSCH_RB	dB				
NOCNG_RA Note 1	dB				
NOCNG_RB Note 1	dB				
Qrxlevmin	dBm	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0
$Qhyst_s$	dB	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0
Cell_selection_and_reselection_quality_measurement		NRSRP		NRSRP	
N_{oc}	dBm/15 kHz	Specified in Table A.4.2.38.1-3			
$\hat{E}_s / N_{oc}$	dB	23	13	-infinity	17.45
$\hat{E}_s / I_{ot}$ Note2	dB	23	-4.53	-infinity	4.24
NRSRP Note2	dBm/15 kHz	-75	-85	-infinity	-80.55
Treselection	s	0	0	0	0
Propagation Condition		AWGN		AWGN	
Antenna Configuration		2x1		2x1	
Timing offset to nCell 1	ms	-		3	

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.2.38.5-2: eCell 1 and eCell2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	eCell 1		eCell 2	
		T1	T2	T1	T2
$BW_{channel}$	MHz	5 or 10		5 or 10	
NOCNG Pattern defined in clause D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD		$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
Qrxlevmin	dBm	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0
$Qhyst_s$	dB	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$ Note2	dBm	3	3	3	3
Treselection	s	0	0	0	0
Propagation Condition		AWGN		AWGN	
Antenna Configuration		2x1		2x1	
Timing offset to eCell 1	ms	-		3	

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Note 3: Void

Before the beginning of T2, UE is under relaxed monitoring where the serving cell measurement is performed every 5.12 s and the infra-frequency measurement for the neighbour cells is relaxed according to subclause 5.2.4.12.0 in TS 36.304 [1].

The cell reselection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on nCell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 2.

The cell re-selection delay to a newly detectable cell shall be less than [69.56] s.

The cell reselection delay to an already detected cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on nCell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 2.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{evaluate,\ serv\_NB\text{-}NC} + T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC} + T_{SI}$.

Where:

$T_{detect,NB\_Intra\_NB\text{-}IoT\text{-}NC}$ See Table 4.6.2.2-1 in clause 4.6.2.2, based on the configured DRX cycle

$T_{evaluate,\ serv\_NB\text{-}NC}$ See Table 4.6.2.2-1 in clause 4.6.2.2, based on the effective DRX cycle after relaxation; [10.24] s is assumed in this test case.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of [69.56] s, allow [70] s for the cell re-selection delay to a newly detectable in the test case.

For the test to pass, both events above shall pass.

The statistical pass/ fail decisions are done separately for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.3 E-UTRAN to UTRAN Cell Re-Selection

4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection

4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority

4.3.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier}$ * $T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT}$ = 0 as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.1.

4.3.1.1.4 Test description

4.3.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.1.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.1.4.1-1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during T2
T2 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell 1	
T3 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
	Neighbour cell		Cell 2	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account
T3		s	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

4.3.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Before T1 the UE is camped on to cell 1. During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed. At the start of T2 cell 2 becomes stronger than $Thresh_{x\_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure on cell 2. At the start of T3 cell 2 becomes weaker than $Thresh_{serving\_low}$, and the UE reselects to Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T1 in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. During T1, Cell 2 shall be powered off and the SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100).

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

5. If the UE responds on Cell 2 within 81s from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 7. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 10.

7. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2.

8. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.

9. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 11. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 10.

10. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

11. Repeat step 2-10 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-1 Table H.2.3-2 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.1.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	5		
s-PrioritySearch1	31 (62dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	18 (36dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	2 (4 dB)		
threshXlow	25 (50 dB)		
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.1.5 Test requirement

Tables 4.3.1.1.4-1, 4.3.1.1.5-1 and 4.3.1.1.5-2 define the primary level settings including test tolerances for inter-RAT cell re-selection E-UTRA FDD to UTRA FDD test case (UTRA is of higher priority).

Table 4.3.1.1.5-1: Cell specific Test Parameters for Cell 1(E-UTRA FDD)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qqualmin for UTRA neighbour cell	dB	-20		
Qrxlevmin for UTRA neighbour cell	dBm	-115		
Qrxlevmin	dBm	-140		
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-82.95	-82.95	-82.95
$\hat{E}_s / I_{ot}$	dB	15.05	15.05	15.05
$\hat{E}_s / N_{oc}$	dB	15.05	15.05	15.05
$Treselection_{EUTRAN}$	s	0		
Snonintrasearch	dB	50		
$Thresh_{x, high}$ (Note 2)	dB	40		
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2 : This refers to the value of $Thresh_{x, high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table 4.3.1.1.5-2: Cell specific test parameters for Cell 2 (higher priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
UTRA RF Channel Number		Channel 2		
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
OCNS_Ec/Ior	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	-∞	11.90	-5.70
I_{oc}	dBm/3,84 MHz	-70.10		
CPICH_Ec/Io	dB	-∞	-10.27	-16.74
CPICH_RSCP	dBm	-∞	-68.20	-85.80
Propagation Condition		AWGN		
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
QrxlevminEUTRA	dBm	-140		
UE_TXPWR_MAX_RACH	dBm	21		
Treselection	s	0		
Sprioritysearch1	dB	62		
Sprioritysearch2	dB	0		
$Thresh_{serving, low}$	dB	36		
$Thresh_{x, low}$ (Note 1)	dB	50		
Note 1: This refers to the value of $Thresh_{x, low}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.				

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateUTRA\_FDD} + T_{SI\text{-}UTRA}$

Where:

$T_{higher\_priority\_search}$ See section 4.2.2 of TS 36.133 [4]; 60s is assumed in this test case

$T_{evaluateUTRA\text{-}FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI\text{-}UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s for higher priority cell search, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority

4.3.1.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier}$ * $T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT}$ = 0 as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.2.

4.3.1.2.4 Test description

4.3.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands..
2. The general test parameter settings are set up according to Table 4.3.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.2.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.2.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table 4.3.1.2.5-1 and 4.3.1.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.2.5-1 and 4.3.1.2.5-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.2.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.2.5 Test requirement

Tables 4.3.1.2.4.1-1, 4.3.1.2.5-1 and 4.3.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.2.5-1: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qqualmin for UTRA neighbour cell	dB	-20	
Qrxlevmin for UTRA neighbour cell	dBm	-115	
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.35	
RSRP	dBm/15 KHz	-84.95	-103.05
$\hat{E}_s / I_{ot}$	dB	14.40	-3.70
$\hat{E}_s / N_{oc}$	dB	14.40	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	42	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.1.2.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	s	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$Thresh_{x, high}$ (Note 1)	dB	48	
Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_FDD} + T_{SI-UTRA}$

Where:

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority

4.3.1.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

4.3.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search} = (60 * N_{layers})$ seconds, where the parameters N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If, after it detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT} = 0$ as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.3.

4.3.1.3.4 Test description

4.3.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.26 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.3.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.1.3.4.3.

5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.3.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case in fading conditions

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN Cell.
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		s	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
T3		s	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send preambles to cell 2
T4		s	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

4.3.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are four successive time periods, with time duration of T1, T2, T3 and T4 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2. Time duration T2 and T4 are not used for cell re-selection in the test.

In the following test procedure, “UE responds on Cell 1” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2” and “UE responds on Cell 2” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.3.1.3.5-1 and 4.3.1.3.5-2.
3. Set the parameters according to T2 in Table 4.3.1.3.5-3 and 4.3.1.3.5-4. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T2 starts.
4. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 within T2, then count a fail for the event “Hold out on Cell 1” and skip to step 10. Otherwise, count a success for the event “Hold out on Cell 1” and after T2 expires continue with step 6.
6. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.
7. The SS waits for random access request information from the UE to perform cell re-selection on Cell 2.
8. If the UE responds on Cell 2 during time duration T3 within 21 seconds from the beginning of time period T3, then count a success for the event “Re-select lower priority Cell 2”.
   Otherwise, count a fail for the event “Re-select lower priority Cell 2”.

9. If the UE responds on Cell 2 within T3, at the moment of the request-reception continue with step 10. Otherwise, after T3 expires skip to step 17.

10. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.

11. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on Cell 1 within T4, then count a fail for the event “Hold out on Cell 2” and skip to step 17. Otherwise, count a success for the event “Hold out on Cell 2” and after T4 expires continue with step 13.

13. The SS shall switch the power setting from T4 to T1 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.

14. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

15. If the UE responds on Cell 1 within T1, at the moment of the request-reception skip to step 17. Otherwise, after T1 expires continue with step 16.

16. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1. Set the parameters according to duration T0 in Table 4.3.1.3.5-1 and 4.3.1.3.5-2.

17. Repeat step 3-16 until a test verdict has been achieved.
    Each of the events “Hold out on Cell 1”, “Re-select lower priority Cell 2” and “Hold out on Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.3.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.3.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection in fading conditions

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	22 (44 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.3.5 Test requirement

Tables 4.3.1.3.4.1-1, 4.3.1.3.5-1, 4.3.1.3.5-2, 4.3.1.3.5-3 and 4.3.1.3.5-4 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority. Note that the time period for T0 is system implementation dependent.

Table 4.3.1.3.5-1: Cell specific test parameters for Cell 1 (Lower priority E-UTRA FDD)

Parameter	Unit	Cell 1
		T0
E-UTRA RF Channel number		1
$BW_{channel}$	MHz	10
Antenna Configuration		1x2
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD
PSS_RA	dB	0
SSS_RA	dB	0
PCFICH_RB	dB	0
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	0
PDCCH_RB	dB	0
PDSCH_RA	dB	0
PDSCH_RB	dB	0
OCNG_RA Note 1	dB	0
OCNG_RB Note 1	dB	0
Qqualmin for UTRA neighbour cell	dB	-20
Qrxlevmin for UTRA neighbour cell	dBm	-115
Qrxlevmin	dBm	-140
N_{oc}	dBm/15 kHz	-104
RSRP	dBm/15 KHz	-82
$\hat{E}_s / I_{ot}$	dB	22
$\hat{E}_s / N_{oc}$	dB	22
$Treselection_{EUTRAN}$	s	0
Snonintrasearch	dB	Not sent
$Thresh_{serving, low}$	dB	44
$Thresh_{x, low}$ (Note 2)	dB	42
Propagation Condition		AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.1.3.5-2: Cell specific test parameters for Cell 2 (Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)
		T0
UTRA RF Channel Number		Channel 2
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior	dB	-0.941
$\hat{I}_{or}/I_{oc}$	dB	13.80
I_{oc}	dBm/3,84 MHz	-70
CPICH_Ec/Io	dB	-10.18
CPICH_RSCP	dBm	-66.20
Propagation Condition		AWGN
Qqualmin	dB	-20
Qrxlevmin	dBm	-115
QrxlevminEUTRA	dBm	-140
UE_TXPWR_MAX_RACH	dBm	21
Treselection	s	0
Sprioritysearch1	dB	42
Sprioritysearch2	dB	0
$Thresh_{x, high}$ (Note 1)	dB	44
Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell		

Table 4.3.1.3.5-3: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1			
$BW_{channel}$	MHz	10			
Correlation Matrix and Antenna Configuration		1x2 Low			
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			
PSS_RA	dB	0			
SSS_RA	dB	0			
PCFICH_RB	dB	0			
PHICH_RA	dB	0			
PHICH_RB	dB	0			
PDCCH_RA	dB	0			
PDCCH_RB	dB	0			
PDSCH_RA	dB	0			
PDSCH_RB	dB	0			
OCNG_RA Note 1	dB	0			
OCNG_RB Note 1	dB	0			
Qqualmin for UTRA neighbour cell	dB	-20			
Qrxlevmin for UTRA neighbour cell	dBm	-115			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
$\hat{E}_s / I_{ot}$	dB	22	22	-3	-3
$\hat{E}_s / N_{oc}$	dB	22	22	-3	-3
$Treselection_{EUTRAN}$	s	0			
Snonintrasearch	dB	Not sent			
$Thresh_{serving, low}$	dB	44			
$Thresh_{x, low}$ (Note 2)	dB	42			
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total t spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system inform threshold for the UTRA target cell.

Table 4.3.1.3.5-4: Cell specific test parameters for Cell 2 (Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2	T3	T4
UTRA RF Channel Number		Channel 2			
CPICH_Ec/Ior	dB	-10			
PCCPCH_Ec/Ior	dB	-12			
SCH_Ec/Ior	dB	-12			
PICH_Ec/Ior	dB	-15			
OCNS_Ec/Ior	dB	-0.941			
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/Io	dB	-10.18	-10.18	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20	-66.20	-66.20
Propagation Condition		AWGN			
Qqualmin	dB	-20			
Qrxlevmin	dBm	-115			
QrxlevminEUTRA	dBm	-140			
UE_TXPWR_MAX_RACH	dBm	21			
Treselection	s	0			
Sprioritysearch1	dB	42			
Sprioritysearch2	dB	0			
$Thresh_{x, high}$ (Note 1)	dB	44			
Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell					

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be less than 10%.

The probability of re-selection from Cell 2 to Cell 1 during T4 observed during testing shall be less than 10%.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on Cell 2. In order to evaluate re-selection delay, the SS first needs to verify that the UE is camped on Cell 1 at the start of T3.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_FDD} + T_{SI-UTRA}$

Where:

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

For the test to pass, all the events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth

4.3.1.4.1 Test purpose

Same test purpose as in clause 4.3.1.2.1.

4.3.1.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support only E-UTRA bands within band group FDD_N and UTRA FDD.

4.3.1.4.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.3.1.2 with the following exceptions:

- Instead of A.4.3.1.2 → use A.4.3.1.4.

4.3.1.4.4 Test description

4.3.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 4.3.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.4.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.4.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case for 5MHz bandwidth

Same as Table 4.3.1.2.4.1-1.

4.3.1.4.4.2 Test procedure

Same test procedure as in clause 4.3.1.2.4.2 with the following exceptions:

- Instead of Table 4.3.1.2.5-1 → use Table 4.3.1.4.5-1.

4.3.1.4.4.3 Message contents

Same message contents as 4.3.1.2.4.3 with the following exceptions:

Table 4.3.1.4.4.3-1: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection for 5MHz bandwidth

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	25	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.4.5 Test requirement

Same test requirement as in clause 4.3.1.2.5 with the following exceptions:

Tables 4.3.1.4.4.1-1, 4.3.1.4.5-1 and 4.3.1.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.4.5-1: Cell specific test parameters for cell 1 (E-UTRA) for 5MHz bandwidth

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
$BW_{channel}$	MHz	5	
OCNG Patterns defined in D.1.16 (OP.16 FDD)		OP.16 FDD	
Note 1: See Table 4.3.1.2.5-1 for the other parameters.			

4.3.1.5 Idle mode FDD to UTRA FDD interRAT reselection

4.3.1.5.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements for increased UE carrier monitoring UTRA when the UTRA FDD cells are of lower priority than E-UTRA serving cell.

4.3.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support increased carrier monitoring UTRA.

4.3.1.5.3 Minimum conformance requirements

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA FDD cells in normal performance group have met the reselection criteria in TS 36.304 within time $N_{UTRA\_carrier,normal}$ * $T_{detectUTRA\_FDD}$, and evaluate whether newly detectable UTRA FDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA\_carrier,reduced}$ * $T_{detectUTRA\_FDD}$ when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ when $Treselection_{RAT}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA FDD cells in normal performance group have met the reselection criteria in TS 36.304 within time ($N_{UTRA\_carrier,normal}$) * $T_{detectUTRA\_FDD}$, and when Srxlev < 3 dB or Squal < 3 dB evaluate whether newly detectable UTRA FDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA\_carrier,reduced}$ * $T_{detectUTRA\_FDD}$ when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$ when $Treselection_{RAT}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, cells which have been detected shall be measured at least every $N_{UTRA\_carrier,normal}$ * $T_{measureUTRA\_FDD}$ for the cells in normal performance group, and at least every 6 * $N_{UTRA\_carrier,reduced}$ * $T_{measureUTRA\_FDD}$ for the cells in reduced performance group when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, cells which have been detected shall be measured at least every ($N_{UTRA\_carrier,normal}$) * $T_{measureUTRA\_FDD}$ for the cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every 6 * $N_{UTRA\_carrier,reduced}$ * $T_{measureUTRA\_FDD}$ for the cells in reduced performance group when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_FDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met reselection criterion defined in TS 36.304 [1] within $N_{UTRA\_carrier,normal}$ * $T_{evaluateUTRA\_FDD}$ if the cell is in normal performance group and within 6 * $N_{UTRA\_carrier,reduced}$ * $T_{evaluateUTRA\_FDD}$ if the cell is in reduced performance group when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met reselection criterion defined in TS 36.304 [1] within ($N_{UTRA\_carrier,normal}$) * $T_{evaluateUTRA\_FDD}$ if the cell is in normal performance group and when Srxlev < 3 dB or Squal < 3 dB within 6 * $N_{UTRA\_carrier,reduced}$ * $T_{evaluateUTRA\_FDD}$ if the cell is in reduced performance group when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

If $T_{reselection}$ timer has a non zero value and the UTRA FDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA FDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detectUTRA\_FDD,}$ $T_{measureUTRA\_FDD}$ and $T_{evaluateUTRA\_FDD}$ are specified in Table 4.2.2.5.1-1. For UE configured with eDRX_IDLE cycle, $T_{detectUTRA\_FDD,}$ $T_{measureUTRA\_FDD}$ and $T_{evaluateUTRA\_FDD}$ are specified in Table 4.2.2.5.1-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detectUTRA\_FDD,}$ $T_{measureUTRA\_FDD}$ and $T_{evaluateUTRA\_FDD}$ when multiple PTWs are used.

Table 4.3.1.5.3-1: $T_{detectUTRA\_FDD}$, $T_{measureUTRA\_FDD}$, and $T_{evaluateUTRA\_FDD}$

DRX cycle length [s]	$T_{detectUTRA\_FDD}$ [s]	$T_{measureUTRA\_FDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_FDD}$ [s] (number of DRX cycles)
0.32	30	5.12 (16)	15.36 (48)
0.64		5.12 (8)	15.36 (24)
1.28		6.4(5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)

Table 4.3.1.5.3-2: $T_{detectUTRA\_FDD}$, $T_{measureUTRA\_FDD}$ and $T_{evaluateUTRA\_FDD}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 1.28s periods)	$T_{detectUTRA\_FDD}$ [s] (number of DRX cycles)	$T_{measureUTRA\_FDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_FDD}$ [s] (number of DRX cycles)
5.12 ≤ eDRX_IDLE cycle length ≤ 2621.44	0.32	≥1.28 (1)	Note 3 (23)	0.96 (3)	Note 3 (9)
	0.64	≥2.56 (2)		1.92 (3)	Note 3 (9)
	1.28	≥3.84 (3)		3.84 (3)	Note 3 (9)
	2.56	≥7.68 (6)		7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.
NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].
NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX\_cycle\_length \times \left\lceil \frac{N}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$$

For higher priority cells, a UE may optionally use a shorter value for $T_{measureUTRA\_FDD}$, which shall not be less than Max(0.64 s, one DRX cycle).

UE which support increased UE carrier monitoring UTRA according to the capabilities in [5,14] shall additionally be capable of monitoring at least

- Depending on UE capability, 6 FDD UTRA carriers, and
- Depending on UE capability, 7 TDD UTRA carriers, and

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC_IDLE state and supporting Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [5,14] shall be capable of monitoring a total of at least 13 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1, 4.2.2.9a and A.4.3.1.5

4.3.1.5.4 Test description

4.3.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure 54 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands..
2. The general test parameter settings are set up according to Table 4.3.1.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.1.5.4.3.

5. There is one E-UTRA FDD cell and two UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.5.4.1-1: General test parameters for E-UTRAN FDD- UTRAN FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell 1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2 and 3, and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3	
T2 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T2
	Neighbour cell		Cell 2, cell 3	
T3 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell 1, cell 2	

T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell 2, cell 3	
UE configured E-UTRA RF Channel Number			1	Serving cell and six UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE configured UTRA RF Channel Number			2,3,4,5,6,7	
Test equipment configuration			Cell 1 uses E-UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(test equipment frequency selection and configuration time) + 960	Initialisation time need to be defined so that cell detection time is taken into account.
T1		s	60	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	350	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

4.3.1.5.4.2 Test procedure

The test scenario comprises of indicating 6 UTRA FDD interfrequency cells on 6 different carriers in the neighbour list of cell 1, cells 2 and 3. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 6 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group and shall exclude other frequencies configured to the UE in the test.

Cell 1, 2 and 3 are identified by the UE during time period T0. Cell 1, cell 2 and cell 3 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3. Cells 2 and 3 all have lower absolute priority than cell 1.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to T0 in Table 4.3.1.5.5-1 and 4.3.1.5.5-2. Propagation conditions are set according to Annex B clause B.1.1. T0 starts. SS provides signals for cell 1 and selects frequencies for cells 2 and 3. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.

3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1

4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 24.

5. The SS shall switch the power setting from T0 to T1 as specified in Table 4.3.1.5.5-1 and 4.3.1.5.5-2.

6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

7. If the UE responds on the Cell 2 during time duration T1 within 59 seconds from the beginning of time period T1, then count a success for the event “Re-select Cell 2”. Otherwise count a fail for the event “Re-select Cell 2”.

8. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, skip to step 10. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, continue with step 9.

9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.5.5-1 and 4.3.1.5.5-2.

11. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on the Cell 1 during time duration T2 within 21 seconds from the beginning of time period T2, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

13 If the UE has re-selected Cell 1 within T2, after the re-selection or when T2 expires, skip to step 15. Otherwise, if T2 expires and the UE has not yet re-selected Cell 1, continue with step 14.

14. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

15. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.5.5-1 and 4.3.1.5.5-2.

16. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 3.

17. If the UE responds on the Cell 3 during time duration T3 within 347 seconds from the beginning of time period T3, then count a success for the event “Re-select Cell 3”. Otherwise count a fail for the event “Re-select Cell 3”.

18. If the UE has re-selected Cell 3 within T3, after the re-selection or when T3 expires, skip to step 20. Otherwise, if T3 expires and the UE has not yet re-selected Cell 3, continue with step 19.

19. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

20. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.1.5.5-1 and 4.3.1.5.5-2.

21. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

22. If the UE responds on the Cell 1 during time duration T4 within 21 seconds from the beginning of time period T4, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

23. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 25. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 24.

24. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell

25. Repeat step 2-25 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.1.5.4.3-1: Common Exception messages for E-UTRAN FDD- UTRAN FDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.5.4.3-2: UTRA SystemInformationBlockType19: Inter-RAT E-UTRAN FDD - UTRA FDD (UTRA FDD is of lower priority) cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	31 (62dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	18 (36dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

Table 4.3.1.5.4.3-3: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD (UTRA FDD is of lower priority) cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType6 ::= SEQUENCE {			
t-ReselectionUTRA	0		
}			
CarrierFreqUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low-r12	24 (52dB)	50 is actual value in dB (25 * 2 dB)	
q-RxLevMin-r12	-57 (-115 dBm)	-115 is actual value in dBm (-57 * 2 + 1 dBm)	
p-MaxUTRA-r12	21 (21 dBm)		
q-QualMin-r12	-20 (-20 dB)		
reducedMeasPerformance-r12	TRUE for Cell 3	If neighbouring inter-frequency cell is configured for reduced measurement performance	
}			

Table 4.3.1.5.4.3-4: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD (UTRA is of lower priority) cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	62		
threshServingLow	36		
cellReselectionPriority	3		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)		
t-ReselectionEUTRA	0		
}			

4.3.1.5.5 Test requirement

Tables 4.3.1.5.4.1-1, 4.3.1.5.5-1 and 4.3.1.5.5-2 define the primary level settings including test tolerances for inter-RAT cell re-selection E-UTRA FDD to UTRA FDD test case for increased UTRA channel monitoring (UTRA is of lower priority).

Table 4.3.1.5.5-1: Cell specific test parameters for E-UTRAN FDD- UTRAN FDD inter-RAT cell reselection test case in AWGN cell 1 (E-UTRAN)

Parameter	Unit	Cell 1				
		T0	T1	T2	T3	T4
E-UTRA RF Channel number		1				
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50				
Io	dBm/4.5MHz(25RB) dBm/9 Mhz (50RB)	-59.06 -56.05	-71.77 -68.76	-59.06 -56.05	-71.77 -68.76	-59.06 -56.05
PDSCH parameters: DL Reference Measurement Channel		OP.16 FDD (5MHz) OP.2 FDD (10MHz)				
PBCH RA	dB	0				
PBCH RB	dB					
PSS RA	dB					
SSS RA	dB					
PCFICH RB	dB					
PHICH RA	dB					
PHICH RB	dB					
PDCCH RA	dB					
PDCCH RB	dB					
PDSCH RA	dB					
PDSCH RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
Qrxlevmin	dBm	-140				
N_{oc} Note 2	dBm	-98				
RSRP Note 3	dBm	-84	-101.7	-84	-101.7	-84
$\hat{E}_s / I_{ot}$	dB	14	-3.7	14	-3.7	14
$\hat{E}_s / N_{oc}$	dB	14	-3.7	14	-3.7	14
$Treselection_{EUTRAN}$	s	0				
Snonintrasearch	dB	62				

$Thresh_{serving, low}$	dB	44
$Thresh_{x, low}$ (Note 4)	dB	40
Propagation Condition		AWGN

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.1.5.5-2: Cell specific test parameters for cells 2 and 3 (UTRA)

Parameter	Unit	Cell 2					Cell 3				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number		Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group					Randomly selected from 4, 5, 6 such that cell 3 is in the reduced performance group				
CPICH_Ec/Ior	dB	-10					-10				
PCCPCH_Ec/Ior	dB	-12					-12				
SCH_Ec/Ior	dB	-12					-12				
PICH_Ec/Ior	dB	-15					-15				
OCNS_Ec/Ior	dB	-0.941					0.941				
$\hat{I}_{or}/I_{oc}$	dB	+11	+11.8	+11.8	-5	+11	+11	-5	+11	+11.8	+11.8
I_{oc}	dBm/3,84 MHz	-70					-70				
CPICH_Ec/Io	dB	-10.33	-10.28	-10.28	-16.19	-10.33	-10.33	-16.19	-10.33	-10.28	-10.28
CPICH_RSCP	dBm	-69	-68.2	-68.2	-85	-69	-69	-85	-69	-68.2	-68.2
Propagation Condition		AWGN					AWGN				
Qqualmin	dB	-20					-20				
Qrxlevmin	dBm	-115					-115				
QrxlevminEUTRA	dBm	-140					-140				
UE_TXPWR_MAX_RACH	dBm	21					21				
Treselection	s	0					0				
Sprioritysearch1	dB	40					40				
Sprioritysearch2	dB	0					0				
$Thresh_{x, high}$ (Note 1)	dB	50					50				

Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table 4.3.1.5.5-1

Table 4.3.1.5.5-3: FFS

Time phase	Target cell	Requirement for reselection delay (seconds)
T0	Cell 1	
T1	Cell 2 (normal performance group)	59
T2	Cell 1 (normal performance group)	21
T3	Cell 3 (reduced performance group)	347
T4	Cell 1 (normal performance group)	21

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: ($N_{UTRA\_carrier,normal}$) * $T_{evaluateUTRA\_FDD}$ + $T_{SI-UTRA}$ and to a reduced performance group cell can be expressed as: 6 * $N_{UTRA\_carrier,reduced}$ * $T_{evaluateUTRA\_FDD}$ + $T_{SI-UTRA}$.

Where:

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1
$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 58.88 s for normal performance group reselection, allow 59 s, and gives a total of 346.88 s for reduced performance group reselection, allow 347 s for reduced performance group in the test case. For reselections back to cell 1 since only one frequency is configured, the requirement is $T_{evaluate,E-UTRAN\_Inter}$, + T_{SI} = 20.48s, allow 21s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.2 E-UTRAN FDD - UTRAN TDD cell re-selection

4.3.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRAN TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA cell is of lower priority.

4.3.2.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD.

4.3.2.3 Minimum conformance requirements

4.3.2.3.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.3.2 1.28Mcps TDD option

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in TS 36.133 [4] table 4.2.2.5.2-1.

If the $S_{ServingCell}$of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 36.133 [4] clauses 4.2.2.

If the $S_{ServingCell}$of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is less than $S_{nonintrasearch}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ *$T_{evaluateUTRA\_TDD}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6 dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.2.

4.3.2.3.3 7.68Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4 Test description

4.3.2.4.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4.2 1.28Mcps TDD option

4.3.2.4.2.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.2.4.2.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.2.4.2.3.
5. There is one E-UTRA FDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.2.4.2.1-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRA FDD cell
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of cell 1			normal	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	

4.3.2.4.2.2 Test procedure

The test consists of one active cell and one neighbour cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the test. Cell 1 and Cell 2 belong to different tracking areas. The UTRA TDD layer is configured at a lower priority than the E-UTRA FDD layer.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS 36.304.

In the following test procedure “UE responds” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table 4.3.2.5.2-1 and 4.3.2.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.2.5.2-1 and 4.3.2.5.2-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 2.
7. If the UE responds on lower priority cell, Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

4.3.2.4.2.3 Message contents

Message contents are according TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.2.4.2.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-8 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.2.4.2.3-2: System Information Block type 19: E-UTRA FDD- lower priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	23 (46 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.2.4.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5 Test requirement

4.3.2.5.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5.2 1.28Mcps TDD option

Tables 4.3.2.4.2-1, 4.3.2.5.2-1 and 4.3.2.5.2-2 defines the primary level settings including test tolerances for E-UTRAN FDD to UTRA TDD cell re-selection test case.

Table 4.3.2.5.2-1: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$Q_{rxlevmin}$	dBm/15kHz	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-86.9	-101.1
$\hat{E}_s / I_{ot}$	dB	11.1	-3.1
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	46 (-94dBm)	
$Thresh_{x, low}$ (Note2)	dB	24 (-79dBm)	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

Table 4.3.2.5.2-2: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior	dB	-3	-3		
$\hat{I}_{or} / I_{oc}$	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.
Propagation Condition		AWGN			
$Q_{rxlevmin}$	dBm	-103			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
$Qhyst1_{s}$	dB	0			
$Thresh_{x, high}$ (Note2)	dB	46 (-94dBm)			

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_TDD} + T_{SI\text{-}UTRA}$

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, as specified in TS 36.133 [4] table 4.2.2.5.2-1

$T_{SI\text{-}UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case.

4.3.2.5.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.2A E-UTRA FDD to UTRA TDD cell re-selection for IncMon

4.3.2A.1 Test purpose

This test is to verify the requirement for the E-UTRA FDD to UTRA TDD inter-RAT cell reselection requirements for increased UE carrier monitoring. UTRA TDD cells are of lower priority than E-UTRA serving cell.

4.3.2A.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support increased carrier monitoring UTRA.

4.3.2A.3 Minimum conformance requirements

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. If the UE is not configured with eDRX_IDLE cycle, P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.2.2.5.2-1. If the UE is configured with eDRX_IDLE cycle, P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.2.2.5.2-2.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA TDD cells in normal performance group have met the reselection criteria in TS 36.304 within time $N_{UTRA\_carrier\_TDD,normal} * T_{detectUTRA\_TDD}$, and evaluate whether newly detectable UTRA TDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time $6 * N_{UTRA\_carrier\_TDD,reduced} * T_{detectUTRA\_TDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA TDD cells in normal performance group have met the reselection criteria in TS 36.304 within time $(N_{UTRA\_carrier\_TDD,normal}) * T_{detectUTRA\_TDD}$, and when Srxlev < 3 dB or Squal < 3 dB evaluate whether newly detectable UTRA TDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time $6 * N_{UTRA\_carrier\_TDD,reduced} * T_{detectUTRA\_TDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, cells which have been detected shall be measured at least every $N_{UTRA\_carrier\_TDD,normal}$ * $T_{measureUTRA\_TDD}$ for the cells in normal performance group, and at least every 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{measureUTRA\_TDD}$ for the cells in reduced performance group, when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD,normal}$) * $T_{measureUTRA\_TDD}$ for the cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{measureUTRA\_TDD}$ for the cells in reduced performance group, when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in [1] within $N_{UTRA\_carrier\_TDD,normal}$ *$T_{evaluateUTRA\_TDD}$ if the cell is in normal performance group and within 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{evaluateUTRA\_TDD}$ if the cell is in reduced performance group when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in [1] within $N_{UTRA\_carrier\_TDD,normal}$ *$T_{evaluateUTRA\_TDD}$ if the cell is in normal performance group and when Srxlev < 3 dB or Squal < 3 dB within 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{evaluateUTRA\_TDD}$ if the cell is in reduced performance group when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

If $T_{reselection}$ timer has a non zero value and the UTRA TDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA TDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detectUTRA\_TDD,}$ $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$ are specified in Table 4.3.2A.3-1. For UE configured with eDRX_IDLE cycle, $T_{detectUTRA\_TDD,}$ $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$ are specified in Table 4.3.2A.3-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detectUTRA\_TDD,}$ $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$ when multiple PTWs are used.

Table 4.3.2A.3-1: $T_{detectUTRA\_TDD}$, $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$

DRX cycle length [s]	$T_{detectUTRA\_TDD}$ [s]	$T_{measureUTRA\_TDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_TDD}$ [s] (number of DRX cycles)
0.32	30	5.12 (16)	15.36 (48)
0.64		5.12 (8)	15.36 (24)
1.28		6.4(5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)

Table 4.3.2A.3-2: $T_{detectUTRA\_TDD}$, $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$ for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s] (number of 1.28s periods)	$T_{detectUTRA\_TDD}$ [s] (number of DRX cycles)	$T_{measureUTRA\_TDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_TDD}$ [s] (number of DRX cycles)
5.12 ≤ eDRX_IDLE cycle length ≤ 2621.44	0.32	≥1.28 (1)	Note 3 (23)	0.96 (3)	Note 3 (9)
	0.64	≥2.56 (2)		1.92 (3)	Note 3 (9)
	1.28	≥3.84 (3)		3.84 (3)	Note 3 (9)
	2.56	≥7.68 (6)		7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.
NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].
NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX\_cycle\_length \times \left\lceil \frac{N}{\lceil PTW / DRX\_cycle\_length \rceil} \right\rceil$$

For higher priority cells, a UE may optionally use a shorter value for $T_{measureUTRA\_TDD}$, which shall not be less than Max(0.64 s, one DRX cycle).

UE which support increased UE carrier monitoring UTRA according to the capabilities in [5,14] shall additionally be capable of monitoring at least

- Depending on UE capability, 6 FDD UTRA carriers, and
- Depending on UE capability, 7 TDD UTRA carriers, and

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC_IDLE state and supporting Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [5,14] shall be capable of monitoring a total of at least 13 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2, 4.2.2.9a and A.4.3.2A

4.3.2A.4 Test description

4.3.2A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure TBS for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.2A.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.2A.4.3.
5. There is one E-UTRA FDD cell and two UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.2A.4.1-1: General test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell1/	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2, 3 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell1	
T2 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T2
T3 end condition	Active cell		Cell3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell1	

T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 in T4 so that next repetition of test can start from T0
UE configured UTRA RF Channel Number			1, 2, 3, 4, 5, 6, 7	Seven UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 4, 5, 6, and 7 are indicated to have reduced performance
Test equipment configuration			Cell 1, 2, 3	Cell 1 uses E-UTRA RF channel number 1 Cells 2 is randomly selected to use different frequencies selected from UTRA frequencies 1, 2, 3. Cells 3 is randomly selected to use different frequencies selected from UTRA frequencies 4, 5, 6, 7.
CP length of cell 1			normal	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [16]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
$T_{reselection}$		s	0	
HCS			Not used	
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(Test equipment frequency selection and configuration time) + 960	T0 is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		s	60	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	500	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

4.3.2A.4.2 Test procedure

The test scenario comprises of indicating 7 UTRA TDD inter-RAT cells on 7 different carriers in the neighbour list of cell 1 as given in tables 4.3.2A.5-1,.4.3.2A.5-2 and 4.3.2A.5-3. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3, and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (E-UTRA serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 7 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group.

Cell 1, 2 and 3 are identified by the UE during time phase T0. Cell 1, cell 2 and cell 3 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T0 in Table 4.3.2A.5-1, 4.3.2A.5-2 and 4.3.2A.5-3. Propagation conditions are set according to Annex B clause B.1.1. T0 starts. SS provides signals for cell 1 and selects frequencies for cells 2 and 3. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1
4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 24.
5. The SS shall switch the power setting from T0 to T1 as specified in Table 4.3.2A.5-1, 4.3.2A.5-2 and 4.3.2A.5-3.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on the Cell 2 during time duration T1 within 58.9 seconds from the beginning of time period T1, then count a success for the event “Re-select Cell 2”. Otherwise count a fail for the event “Re-select Cell 2”.
8. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, skip to step 10. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, continue with step 9.

9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.2A.5-1, 4.3.2A.5-2 and 4.3.2A.5-3.

11. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on the Cell 1 during time duration T2 within 20.5 seconds from the beginning of time period T2, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

13 If the UE has re-selected Cell 1 within T2, after the re-selection or when T2 expires, skip to step 15. Otherwise, if T2 expires and the UE has not yet re-selected Cell 1, continue with step 14.

14. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

15. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.5.5-1 and 4.3.1.5.5-2.

16. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 3.

17. If the UE responds on the Cell 3 during time duration T3 within 462.1 seconds from the beginning of time period T3, then count a success for the event “Re-select Cell 3”. Otherwise count a fail for the event “Re-select Cell 3”.

18. If the UE has re-selected Cell 3 within T3, after the re-selection or when T3 expires, skip to step 20. Otherwise, if T3 expires and the UE has not yet re-selected Cell 3, continue with step 19.

19. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

20. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.2A.5-1, 4.3.2A.5-2 and 4.3.2A.5-3..

21. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

22. If the UE responds on the Cell 1 during time duration T4 within 20.5 seconds from the beginning of time period T4, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

23. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 25. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 24.

24. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell

25. Repeat step 2-24 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.2A.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.2A.4.3-1: Common Exception messages for E-UTRAN FDD- UTRAN FDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.2A.4.33-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

Table 4.3.2A.4.3-3: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low-r12	24		
q-RxLevMin-r12	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 + 1 dBm)	
p-MaxUTRA-r12	21 (21 dBm)		
reducedMeasPerformance-r12	TRUE for Cell 3	If neighbouring inter-frequency cell is configured for reduced measurement performance	
}			

Table 4.3.2A.4.3-4: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	46		

4.3.2A.5 Test requirement

Tables 4.3.2A.4.1-1, 4.3.2A.5-1, 4.3.2A.5-2 and 4.3.2A.5-3 defines the primary level settings including test tolerances for E-UTRAN FDD to UTRA TDD cell re-selection test case.

Table 4.3.2A.5-1: E-UTRA Cell specific test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 1				
		T0	T1	T2	T3	T4
E-UTRA RF Channel number		1				
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50				
OCNG Patterns		5MHz: OP.16 FDD 10MHz: OP.2 FDD				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA NOTE 1	dB					
OCNG_RB NOTE 1	dB					
N_{oc} NOTE 2	dBm/15kHz	-98				
$\hat{E}_s / N_{oc}$	dB	11.05	-3.05	11.05	-3.05	11.05
$\hat{E}_s / I_{ot}$ NOTE 3	dB	11.05	-3.05	11.05	-3.05	11.05
RSRP NOTE 3	dBm/15kHz	-86.95	-101.05	-86.95	-101.05	-86.95
$Q_{rxlevmin}$	dBm/15kHz	-140				
$S_{nonintrasearch}$	dB	Not sent				
$Thresh_{serving, low}$	dB	46 (-94dBm)				
$Thresh_{x, low}$ NOTE 4	dB	24 (-79dBm)				
Propagation Condition		AWGN				
Antenna Configuration		1x2				

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.
NOTE 3: E_s/I_{ot} and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

Table 4.3.2A.5-2: UTRA TDD Cell specific test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 2 (UTRA TDD)									
Timeslot Number		0					DwPTS				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number NOTE 1		Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group									
PCCPCH_Ec/Ior	dB	-3									
DwPCH_Ec/Ior	dB						0				
OCNS_Ec/Ior	dB	-3									
I_{oc}	dBm/ 1.28 MHz	-80									
$\hat{I}_{or}/I_{oc}$	dB	-3	11	-3	-3	-3	-3	11	-3	-3	-3
PCCPCH RSCP	dBm	-86	-72	-86	-86	-86	n.a.				
Propagation Condition		AWGN									
$Q_{rxlevmin}$	dBm	-103									
$Qoffset1_{s,n}$	dB	C1, C2: 0									
$Qhyst1_{s}$	dB	0									
$S_{prioritysearch1}$	dB	24 (-79dBm)									
$S_{prioritysearch2}$	dB	0									
$Thresh_{x, high}$ NOTE 2	dB	46 (-94dBm)									
$Ssearch_{E-UTRA}$	dB	Not send									
Time offset to cell1	ms	3									

NOTE 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
NOTE 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table 4.3.2A.5-3: UTRA TDD Cell specific test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 3 (UTRA TDD)									
Timeslot Number		0					DwPTS				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number NOTE 1		Randomly selected from 4, 5, 6, 7 such that cell 3 is in the reduced performance group									
PCCPCH_Ec/Ior	dB	-3									
DwPCH_Ec/Ior	dB						0				
OCNS_Ec/Ior	dB	-3									
I_{oc}	dBm/ 1.28 MHz	-80									
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	11	-3	-3	-3	-3	11	-3
PCCPCH RSCP	dBm	-86	-86	-86	-72	-86	n.a.				
Propagation Condition		AWGN									
$Q_{rxlevmin}$	dBm	-103									
$Qoffset1_{s,n}$	dB	C1, C2: 0									
$Qhyst1_{s}$	dB	0									
$S_{prioritysearch1}$	dB	24 (-79dBm)									
$S_{prioritysearch2}$	dB	0									
$Thresh_{x, high}$ NOTE 2	dB	46 (-94dBm)									
$Ssearch_{E-UTRA}$	dB	Not send									
Time offset to cell1	ms	3									
Time offset to cell2	µs	3									

NOTE 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
NOTE 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send the SYNCH-UL sequence in the UpPTS on cell 2, 3 for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table 4.3.2A.5-4

Table A.4.3.2A.5-4: Test requirements for E-UTRA FDD to UTRA TDD inter-RAT cell reselection

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	58.9
T3	Cell 3 (reduced performance group)	462.1

The rate of correct cell reselections observed during repeated tests shall be at least 90%, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time with a confidence level of 95%.

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $N_{UTRA\_carrier\_TDD,normal}$ *$T_{evaluateUTRA\_TDD}$ + T_{SI_UTRA}, and to a reduced performance group cell can be expressed as: 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{evaluateUTRA\_TDD}$ + T_{SI_UTRA},

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, See Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 3 * 19.2 + 1.28 = 58.88 s for normal performance group reselection and 6 * 4 * 19.2 + 1.28 = 462.08s for reduced performance group reselection, allow 58.9s for normal performance group and 462.1s for reduced performance group in the test case.

Since only one E-UTRA frequency is configured and signal level of UTRA cell is lower than threshold of $S_{prioritysearch}$, the UE shall select back to cell 1 (E-UTRA cell) within $K_{carrier}$ * $T_{evaluateEUTRA}$ + T_{SI} = 19.2 + 1.28 = 20.48s.

4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection

4.3.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD.

4.3.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 when $Treselection_{RAT} = 0$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.3.

4.3.3.4 Test description

4.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.3.4.3.

5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.3.4.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			53	As specified in table 5.7.1-2 in TS 36.211
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table 4.3.3.5-1 and 4.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.3.5-1 and 4.3.3.5-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.3.4.3-2: System Information Block type 19: EUTRA TDD- lower priority UTRA FDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.3.5 Test requirement

Tables 4.3.3.4.1-1, 4.3.3.5-1 and 4.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN FDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.3.5-1: Cell specific test parameters for Cell 1(E-UTRA TDD)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qqualmin for UTRA neighbour cell	dB	-20	
Qrxlevmin for UTRA neighbour cell	dBm	-115	
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.35	
RSRP	dBm/15 KHz	-84.95	-103.05
$\hat{E}_s / I_{ot}$	dB	14.40	-3.70
$\hat{E}_s / N_{oc}$	dB	14.40	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	42	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.3.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$Thresh_{x, high}$ (Note 1)	dB	48	
Note: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluateUTRA\_FDD} + T_{SI-EUTRA}$

$T_{evaluateUTRA\_FDD}$ = 19.2 s; as specified in TS 36.133 [4] clause 4.2.2.5

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.3A Idle mode TDD to UTRA FDD interRAT reselection

4.3.3A.1 Test purpose

This test is to verify the requirement for the E-UTRA TDD to UTRA FDD inter-RAT cell reselection requirements for increased UE carrier monitoring UTRA. UTRA FDD cells are of lower priority than E-UTRA serving cell.

4.3.3A.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support increased carrier monitoring UTRA.

4.3.3A.3 Minimum conformance requirements

Same as 4.3.1.5.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1, 4.2.2.9a and A.4.3.3A

4.3.3A.4 Test description

4.3.3A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.3.3A.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.3A.4.3.

5. There is one E-UTRA FDD cell and two UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.3A.4-1: General test parameters for E-UTRAN TDD- UTRAN FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell 1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2, 3 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3	
T2 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T2
	Neighbour cell		Cell 2, cell 3	
T3 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell 1, cell 2	

T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell 2, cell 3	
UE configured E-UTRA RF Channel Number			1	Serving cell and six UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE configured UTRA RF Channel Number			2,3,4,5,6,7	
Test equipment configuration			Cell 1 uses E-UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(test equipment frequency selection and configuration time) + 960	Initialisation time need to be defined so that cell detection time is taken into account.
T1		s	60	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	350	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

Table 4.3.3A.4-2: General test parameters for EUTRA TDD- UTRA FDD inter RAT cell re-selection test case

Parameter	Unit	Value	Comment
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211

4.3.3A.4.2 Test procedure

The test scenario comprises of indicating 6 UTRA FDD interfrequency cells on 6 different carriers in the neighbour list of cell 1, cells 2 and 3. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 6 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group and shall exclude the other frequencies configured to the UE in the test. Cell 1, 2 and 3 are identified by the UE during time period T0. Cell 1, cell 2 and cell 3 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3. Cells 2 and 3 all have lower absolute priority than cell 1.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to T0 in Table 4.3.1.5.5-1 and 4.3.1.5.5-2. Propagation conditions are set according to Annex B clause B.1.1. T0 starts. SS provides signals for cell 1 and selects frequencies for cells 2 and 3. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.

3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1

4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 24.

5. The SS shall switch the power setting from T0 to T1 as specified in Tables 4.3.3A.5-1, 4.3.3A.5-2 and 4.3.3A.5-3.

6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

7. If the UE responds on the Cell 2 during time duration T1 within 59 seconds from the beginning of time period T1, then count a success for the event “Re-select Cell 2”. Otherwise count a fail for the event “Re-select Cell 2”.

8. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, skip to step 10. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, continue with step 9.

9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. The SS shall switch the power setting from T1 to T2 as specified in Tables 4.3.3A.5-1, 4.3.3A.5-2 and 4.3.3A.5-3.

11. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on the Cell 1 during time duration T2 within 21 seconds from the beginning of time period T2, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

13 If the UE has re-selected Cell 1 within T2, after the re-selection or when T2 expires, skip to step 15. Otherwise, if T2 expires and the UE has not yet re-selected Cell 1, continue with step 14.

14. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

15. The SS shall switch the power setting from T2 to T3 as specified in Tables 4.3.3A.5-1, 4.3.3A.5-2 and 4.3.3A.5-3.

16. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 3.

17. If the UE responds on the Cell 3 during time duration T3 within 347 seconds from the beginning of time period T3, then count a success for the event “Re-select Cell 3”. Otherwise count a fail for the event “Re-select Cell 3”.

18. If the UE has re-selected Cell 3 within T3, after the re-selection or when T3 expires, skip to step 20. Otherwise, if T3 expires and the UE has not yet re-selected Cell 3, continue with step 19.

19. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

20. The SS shall switch the power setting from T3 to T4 as specified in Tables 4.3.3A.5-1, 4.3.3A.5-2 and 4.3.3A.5-3.

21. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

22. If the UE responds on the Cell 1 during time duration T4 within 21 seconds from the beginning of time period T4, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

23. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 25. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 24.

24. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell

25. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.3A.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.3A.4.3-1: Common Exception messages for E-UTRAN FDD- UTRAN FDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.3A.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

Table 4.3.3A.4.3-3: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low-r12	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
q-RxLevMin-r12	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 + 1 dBm)	
p-MaxUTRA-r12	21 (21 dBm)		
q-QualMin-r12	-20 (-20 dB)		
reducedMeasPerformance-r12	TRUE for Cell 3	If neighbouring inter-frequency cell is configured for reduced measurement performance	
}			

4.3.3A.5 Test requirement

Tables 4.3.2A.4.1-1, 4.3.3A.5-1, 4.3.3A.5-2 and 4.3.3A.5-3 defines the primary level settings including test tolerances for E-UTRAN FDD to UTRA TDD cell re-selection test case.

Table 4.3.3A.5-1: Cell specific test parameters for E-UTRAN TDD- UTRAN FDD inter-RAT cell reselection test case in AWGN cell 1 (E-UTRAN)

Parameter	**Unit**	**Cell 1**				
		T0	**T1**	**T2**	**T3**	**T4**
E-UTRA RF Channel number		1				
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50				
Io	dBm/4.5MHz(25RB) dBm/9 Mhz (50RB)	-59.06 -56.05	-71.77 -68.76	-59.06 -56.05	-71.77 -68.76	-59.06 -56.05
PDSCH parameters: DL Reference Measurement Channel		OP.10 TDD(5MHz) OP.2 TDD (10MHz)				
PBCH RA	dB	0				
PBCH RB	dB					
PSS RA	dB					
SSS RA	dB					
PCFICH RB	dB					
PHICH RA	dB					
PHICH RB	dB					
PDCCH RA	dB					
PDCCH RB	dB					
PDSCH RA	dB					
PDSCH RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
Qrxlevmin	dBm	-140				
N_{oc} Note 2	dBm	-98				

RSRP Note 3	dBm	-84	-101.7	-84	-101.7	-84
$\hat{E}_s/I_{ot}$	dB	14	-3.7	14	-3.7	14
$\hat{E}_s/N_{oc}$	dB	14	-3.7	14	-3.7	14
$Treselection_{EUTRAN}$	s	0				
Snonintrasearch	dB	62				
$Thresh_{serving, low}$	dB	44				
$Thresh_{x, low}$ (Note 4)	dB	40				
Propagation Condition		AWGN				

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.3A.5-2: Cell specific test parameters for cells 2 and 3 (UTRA)

Parameter	Unit	Cell 2					Cell 3				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number		Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group					Randomly selected from 4, 5, 6 such that cell 3 is in the reduced performance group				
CPICH_Ec/Ior	dB	-10					-10				
PCCPCH_Ec/Ior	dB	-12					-12				
SCH_Ec/Ior	dB	-12					-12				
PICH_Ec/Ior	dB	-15					-15				
OCNS_Ec/Ior	dB	-0.941					0.941				
$\hat{I}_{or}/I_{oc}$	dB	+11	+11.8	+11.8	-5	+11	+11	-5	+11	+11.8	+11.8
I_{oc}	dBm/3,84 MHz	-70					-70				
CPICH_Ec/Io	dB	-10.33	-10.28	-10.28	-16.19	-10.33	-10.33	-16.19	-10.36	-10.28	-10.28
CPICH_RSCP	dBm	-69	-68.2	-68.2	-85	-69	-69	-85	-69	-68.2	-68.2
Propagation Condition		AWGN					AWGN				
Qqualmin	dB	-20					-20				
Qrxlevmin	dBm	-115					-115				
QrxlevminEUTRA	dBm	-140					-140				
UE_TXPWR_MAX_RACH	dBm	21					21				
Treselection	s	0					0				
Sprioritysearch1	dB	40					40				
Sprioritysearch2	dB	0					0				
$Thresh_{x, low}$ (Note 1)	dB	50					50				

Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table 4.3.3A.5-3.

Table 4.3.3A.5-3

Time phase	Target cell	Requirement for reselection delay (seconds)
T0	Cell 1	
T1	Cell 2 (normal performance group)	59
T2	Cell 1 (normal performance group)	21
T3	Cell 3 (reduced performance group)	347
T4	Cell 1 (normal performance group)	21

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: ($N_{UTRA\_carrier,normal}$) * $T_{evaluateUTRA\_FDD}$ + $T_{SI-UTRA}$ and to a reduced performance group cell can be expressed as: 6 * $N_{UTRA\_carrier,reduced}$ * $T_{evaluateUTRA\_FDD}$ + $T_{SI-UTRA.}$

Where:

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 58.88 s for normal performance group reselection, allow 59 s, and gives a total of 346.88 s for reduced performance group reselection, allow 347 s for reduced performance group in the test case. For reselections back to cell 1 since only one frequency is configured, the requirement is $T_{evaluate,E-UTRAN\_Inter}$, + T_{SI} = 20.48, allow 21s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection

4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection: UTRA is of higher priority

4.3.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.4.1.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when

the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ * $T_{evaluateUTRA\_TDD}$ when $Treselection_{RAT}$ = 0.as specified in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.1.

4.3.4.1.4 Test description

4.3.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.1.4.3.
5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.1.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during the first T2 phase
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
T3 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T3
	Neighbour cell		Cell2	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
PRACH configuration of cell 1			53	As specified in table 5.7.1-3 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.
T3		s	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

4.3.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Before T1 the UE is camped on to cell 1. During T1, cell 2 shall be powered off, and during the off time the cell id shall be changed. At starting T2 cell 2 becomes stronger than $Thresh_{x\_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 2. At the start of T3, cell 2 becomes weaker than $Thresh_{serving\_low}$, and the UE reselects to Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to duration T1 in Table 4.3.4.1.5-1and 4.3.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. During T1, cell 2 shall be powered off and the SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

5. If the UE responds on Cell 2 within 81s from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 7. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 10.

7. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2.

8. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.

9. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 11. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 10.

10. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

11. Repeat step 2-10 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-3 Table H.2.3-4 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.1.4.3-2: System Information Block type 19: E-UTRA TDD- higher priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	5		
s-PrioritySearch1	31 (62dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	12 (24dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	2 (4 dB)		
threshXlow	23 (46 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.1.5 Test requirement

Tables 4.3.4.1.4-1, 4.3.4.1.5-1 and 4.3.4.1.5-2 define the primary level settings including test tolerances for cell re-selection E-UTRA TDD to UTRA TDD test case (UTRA is of higher priority).

Table 4.3.4.1.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD		
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$Q_{rxlevmin}$	dBm	-140	-140	-140
N_{oc}	dBm/15kHz	-98		
RSRP	dBm/15kHz	-86.9	-86.9	-86.9
$\hat{E}_s / I_{ot}$	dB	11.1	11.1	11.1
$Thresh_{x, high}$ (Note2)	dB	24(-79dBm)		
$S_{nonintrasearch}$	dB	46		
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.4.1.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number (Note1)		Channel 2					
PCCPCH_Ec/Ior	dB	-3	-3	-3			
DwPCH_Ec/Ior	dB				0	0	0
OCNS_Ec/Ior	dB	-3	-3	-3			
$\hat{I}_{or}/I_{oc}$	dB	-inf	11	-3	-inf	11	-3
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-inf	-72	-86	n.a.		
Propagation Condition		AWGN					
$Q_{rxlevmin}$	dBm	-103					
$Qoffset_{s,n}$	dB	C1, C2: 0					
$Qhyst_{s}$	dB	0					
$S_{nonintrasearch}$	dB	Not sent					
$Thresh_{serving, low}$	dB	24 (-79dBm)					
$Thresh_{x, low}$ (Note2)	dB	46 (-94dBm)					
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of Threshx, low which is included in UTRA system information, and is a threshold for the E-UTRA target cell.							

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateUTRA\_TDD} + T_{SI\_UTRA}$,

Where:

$T_{higher\_priority\_search}$ 60s, See TS 36.133 [4] section 4.2.2.5

$T_{evaluateUTRA\_TDD}$ 19.2s, See TS 36.133 [4] Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that need to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.2 E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority

4.3.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.4.2.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure such layers is not reduced and shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ * $T_{evaluateUTRA\_TDD}$ when $Treselection_{RAT}$ = 0 as specified in table 4.2.2.5.2-1of TS 36.133 [4] provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.2.

4.3.4.2.4 Test description

4.3.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.4.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.2.4.3.

5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.2.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD Cell
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
PRACH configuration of cell 1			53	As specified in table 5.7.1-3 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	
T2		s	25	

4.3.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA TDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

In the following test procedure “UE responds” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to T1 in Table 4.3.4.2.5-1 and 4.3.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.

3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.

5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.2.5-1 and 4.3.4.2.5-2.

6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.

9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-8 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.2.4.3-2: System Information Block type 19: E-UTRA FDD- lower priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	23 (46 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.2.5 Test requirement

Tables 4.3.4.2.4.1-1, 4.3.4.2.5-1 and 4.3.4.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN TDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.4.2.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA(Note1)	dB		
OCNG_RB(Note1)	dB		
$Q_{rxlevmin}$	dBm	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-86.9	-101.1
$\hat{E}_s / I_{ot}$	dB	11.1	-3.1
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	46 (-94dBm)	
$Thresh_{x, low (Note2)}$	dB	24 (-79dBm)	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table 4.3.4.2.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior	dB	-3	-3		
$\hat{I}_{or} / I_{oc}$	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.
Propagation Condition		AWGN			
$Q_{rxlevmin}$	dBm	-103			
$Qoffset_{s,n}$	dB	C1, C2: 0			
$Qhyst_s$	dB	0			
$Thresh_{x, high}$ (Note2)	dB	46 (-94dBm)			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information and is a threshold for the E-UTRA target cell.

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2 and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure on Cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_TDD} + T_{SI\_UTRA}$,

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, See Table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case. For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority

4.3.4.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

4.3.4.3.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.3.4.3.3-1.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 [6] within time $(N_{UTRA\_carrier\_TDD}) * T_{detectUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every $(N_{UTRA\_carrier\_TDD}) * T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD} * T_{evaluateUTRA\_TDD}$ when $T_{reselection} = 0$ as specified in table 4.3.4.3.3-1 provided that the reselection criteria is met by a margin of at least 6dB.

Table 4.3.4.3.3-1: $T_{detectUTRA\_TDD}$, $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$

DRX cycle length [s]	$T_{detectUTRA\_TDD}$ [s]	$T_{measureUTRA\_TDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_TDD}$ [s] (number of DRX cycles)
0.32	30	5.12 (16)	15.36 (48)
0.64		5.12 (8)	15.36 (24)
1.28		6.4(5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.3.

4.3.4.3.4 Test description

4.3.4.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.26 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.4.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.3.4.3.
5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.3.4.1-1: General test parameters for EUTRA TDD- lower priority UTRA TDD inter RAT cell re-selection test case in fading conditions

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [9]
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		s	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
T3		s	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send PRACH preambles to cell 2
T4		s	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

4.3.4.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA TDD carrier. In the test there are four successive time periods, with time duration of T1, T2, T3 and T4 respectively. Both E-UTRA Cell 1 and UTRA Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2. Time duration T2 and T4 are not used for cell re-selection in the test.

In the following test procedure, “UE responds on Cell 1” means “UE starts transmitting preamble on PRACH for sending RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2” and “UE responds on Cell 2” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.3.4.3.5-1 and 4.3.4.3.5-2.
3. Set the parameters according to T2 in Table 4.3.4.3.5-3 and 4.3.4.3.5-4. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T2 starts.
4. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 within T2, then count a fail for the event “Hold out on Cell 1” and skip to step 10. Otherwise, count a success for the event “Hold out on Cell 1” and after T2 expires continue with step 6.
6. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.
7. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

8. If the UE responds on Cell 2 during time duration T3 within 21 seconds from the beginning of time period T3, then count a success for the event "Re-select lower priority Cell 2".
   Otherwise, count a fail for the event "Re-select lower priority Cell 2".

9. If the UE responds on Cell 2 within T3, at the moment of the request-reception continue with step 10.
   Otherwise, after T3 expires skip to step 17.

10. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.

11. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on Cell 1 within T4, then count a fail for the event "Hold out on Cell 2" and skip to step 17.
    Otherwise, count a success for the event "Hold out on Cell 2" and after T4 expires continue with step 13.

13. The SS shall switch the power setting from T4 to T1 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.

14. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

15. If the UE responds on Cell 1 within T1, at the moment of the request-reception skip to step 17.
    Otherwise, after T1 expires continue with step 16.

16. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
    Set the parameters according to duration T0 in Table 4.3.4.3.5-1 and 4.3.4.3.5-2.

17. Repeat step 3-16 until a test verdict has been achieved.
    Each of the events "Hold out on Cell 1", "Re-select lower priority Cell 2" and "Hold out on Cell 2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.3.4.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-8
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.3.4.3-2: System Information Block type 3 (1.28 Mcps TDD): Inter-RAT E-UTRA TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- SIB4 Indicator	TRUE		
- Cell identity	0000 0000 0000 0000 0000 0000 0001B		
- Cell selection and re-selection info			
- Mapping info	Not present		
- Cell selection and reselection quality measure	(no data)		
- CHOICE mode	TDD		
- Sintrasearch	10 dB		
- Sintersearch	10 dB		
- SsearchHCS	Not present		
- RAT List	Not present		
- Qrxlevmin	-103 dBm		
- Qhyst1s	0 dB		
- Treselections	0 seconds		

- HCS Serving cell information - Maximum allowed UL TX power	Not present 21dBm		

Table 4.3.4.3.4.3-3: System Information Block type 19: Inter-RAT E-UTRA TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	22 (44 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.3.5 Test requirement

Tables 4.3.4.3.4.1-1, 4.3.4.3.5-1, 4.3.4.3.5-2, 4.3.4.3.5-3 and 4.3.4.3.5-4 define the primary level settings including test tolerances for E-UTRA TDD- UTRA TDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.4.3.5-1: Cell specific test parameters for Cell 1 (E-UTRA TDD)

Parameter	Unit	Cell 1
		T0
E-UTRA RF Channel number		1
$BW_{channel}$	MHz	10
Antenna Configuration		1x2
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD
PSS_RA	dB	0
SSS_RA	dB	0
PCFICH_RB	dB	0
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	0
PDCCH_RB	dB	0
PDSCH_RA	dB	0
PDSCH_RB	dB	0
OCNG_RA Note 1	dB	0
OCNG_RB Note 1	dB	0
Qrxlevmin for UTRA neighbour cell	dBm	-103
Qrxlevmin	dBm	-140
N_{oc}	dBm/15 kHz	-104
RSRP	dBm/15 kHz	-82
$\hat{E}_s / I_{ot}$	dB	22
$\hat{E}_s / N_{oc}$	dB	22
$Treselection_{EUTRAN}$	s	0
Snonintrasearch	dB	Not sent
$Thresh_{serving, low}$	dB	44
$Thresh_{x, low}$ (Note 2)	dB	24
Propagation Condition		AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.4.3.5-2: Cell specific test parameters for Cell 2 (UTRA TDD)

Parameter	Unit	Cell 2 (UTRA)
		T0
Timeslot Number		0
UTRA RF Channel Number (Note 1)		Channel 2
PCCPCH_Ec/Ior	dB	-3
DwPCH_Ec/Ior	dB	
OCNS_Ec/Ior	dB	-3
$\hat{I}_{or}/I_{oc}$	dB	13
I_{oc}	dBm/1.28 MHz	-80
PCCPCH RSCP	dBm	-70
Propagation Condition		AWGN
Qrxlevmin	dBm	-103
QrxlevminEUTRA	dBm	-140
UE_TXPWR_MAX_RACH	dBm	21
Treselection	s	0
$Thresh_{x, high}$ (Note 2)	dB	44

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table 4.3.4.3.5-3: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1			
Correlation Matrix and Antenna Configuration		1x2 Low			
$BW_{channel}$	MHz	10			
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD			
PSS_RA	dB	0			
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
Qrxlevmin for UTRA neighbour cell	dBm	-103			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
$\hat{E}_s / I_{ot}$	dB	22	22	-3	-3
$\hat{E}_s / N_{oc}$	dB	22	22	-3	-3
$Treselection_{EUTRAN}$	s	0			
Snonintrasearch	dB	Not sent			
$Thresh_{serving, low}$	dB	44			
$Thresh_{x, low}$ (Note 2)	dB	24			
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.4.3.5-4: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)							
Timeslot Number		0				DwPTS			
		T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number (Note1)		Channel 2							
PCCPCH_Ec/Ior	dB	-3							
DwPCH_Ec/Ior	dB					0			
OCNS_Ec/Ior	dB	-3							
$\hat{I}_{or}/I_{oc}$	dB	13	13	13	13	13	13	13	13
I_{oc}	dBm/1.28 MHz	-80							
PCCPCH RSCP	dBm	-70	-70	-70	-70	n.a.	n.a.	n.a.	n.a.
Propagation Condition		AWGN							
Qrxlevmin	dBm	-103							
$Qrxlevmin_{EUTRA}$	dBm	-140							
UE_TXPWR_MAX_RACH	dBm	21							
Treselection	s	0							
$Thresh_{x, high}$ (Note2)	dB	44							
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.									
Note2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell									

The probability of reselection from cell 1 to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2. In order to evaluate reselection delay, the system simulator first needs to verify that the UE is camped on cell 1 at the start of T3

The cell re-selection delay to lower priority cell can be expressed as:

Cell re-selection delay to lower priority = $T_{evaluateUTRA\_TDD} + T_{SI-UTRA}$

$T_{evaluateUTRA\_TDD}$ 19.2s, as specified in TS 36.133 [4] Table 4.2.2.5.2-1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, all the events above shall pass.

The statistical pass/ fail decisions are done separated for each event. For an event to pass, the total number of successful loops shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.4 E-UTRA TDD to UTRA TDD cell re-selection for IncMon

4.3.4.4.1 Test purpose

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell reselection requirements for increased UE carrier monitoring. UTRA TDD cells are of lower priority than E-UTRA serving cell.

4.3.4.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that support increased carrier monitoring UTRA.

4.3.4.4.3 Minimum conformance requirements

Same as 4.3.2A.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1, 4.2.2.9a and A.4.3.4.4

4.3.4.4.4 Test description

4.3.4.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.3.4.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.2A.4.2.3.
5. There is one E-UTRA TDD cell and two UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.4.4.1-1: General test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell re-selection test case

Parameter		Unit	Value	Comment
T0	Active cell		Cell1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2, 3 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell1	
T2 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T2
T3 end condition	Active cell		Cell3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell1	

T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 in T4 so that next repetition of test can start from T0
UE configured UTRA RF Channel Number			1, 2, 3, 4, 5, 6, 7	Seven UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 4, 5, 6, and 7 are indicated to have reduced performance
Test equipment configuration			Cell 1, 2, 3	Cell 1 uses E-UTRA RF channel number 1 Cells 2 is randomly selected to use different frequencies selected from UTRA frequencies 1, 2, 3. Cells 3 is randomly selected to use different frequencies selected from UTRA frequencies 4, 5, 6, 7.
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [16]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [16]
CP length of cell 1			normal	
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [16]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
$T_{reselection}$		s	0	
HCS			Not used	
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T0		s	(Test equipment frequency selection and configuration time) + 960	T0 is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		s	60	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		s	500	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re-selection reaction time is taken into account

4.3.4.4.4.2 Test procedure

The test scenario comprises of indicating 7 UTRA TDD inter-RAT cells on 7 different carriers in the neighbour list of cell 1 as given in tables 4.3.4.4.4.1-1, 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3.. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3, and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (E-UTRA serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 7 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group as well as the other UTRA TDD frequencies configured to the UE in the test.

Cell 1, 2, and 3 are identified by the UE during time phase T0. Cell 1, cell 2, and cell 3 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T0 in Tables 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3. Propagation conditions are set according to Annex B clause B.1.1. T0 starts. SS provides signals for cell 1 and selects frequencies for cells 2 and 3. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1
4. If the UE has re-selected Cell 1 within T0, after the re-selection or when T0 expires, continue with step 5. Otherwise, if T0 expires and the UE has not yet re-selected Cell 1, skip to step 24.
5. The SS shall switch the power setting from T0 to T1 as specified in Tables 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

7. If the UE responds on the Cell 2 during time duration T1 within 58.9 seconds from the beginning of time period T1, then count a success for the event “Re-select Cell 2”. Otherwise count a fail for the event “Re-select Cell 2”.

8. If the UE has re-selected Cell 2 within T1, after the re-selection or when T1 expires, skip to step 10. Otherwise, if T1 expires and the UE has not yet re-selected Cell 2, continue with step 9.

9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

10. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3.

11. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on the Cell 1 during time duration T2 within 20.5 seconds from the beginning of time period T2, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

13 If the UE has re-selected Cell 1 within T2, after the re-selection or when T2 expires, skip to step 15. Otherwise, if T2 expires and the UE has not yet re-selected Cell 1, continue with step 14.

14. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

15. The SS shall switch the power setting from T2 to T3 as specified in Tables 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3.

16. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 3.

17. If the UE responds on the Cell 3 during time duration T3 within 462.1 seconds from the beginning of time period T3, then count a success for the event “Re-select Cell 3”. Otherwise count a fail for the event “Re-select Cell 3”.

18. If the UE has re-selected Cell 3 within T3, after the re-selection or when T3 expires, skip to step 20. Otherwise, if T3 expires and the UE has not yet re-selected Cell 3, continue with step 19.

19. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

20. The SS shall switch the power setting from T3 to T4 as specified in Tables 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3.

21. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.

22. If the UE responds on the Cell 1 during time duration T4 within 20.5 seconds from the beginning of time period T4, then count a success for the event “Re-select Cell 1”. Otherwise count a fail for the event “Re-select Cell 1”.

23. If the UE has re-selected Cell 1 within T4, after the re-selection or when T4 expires, skip to step 25. Otherwise, if T4 expires and the UE has not yet re-selected Cell 1, continue with step 24.

24. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell

25. Repeat step 2-24 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.4.4.4.3-1: Common Exception messages for E-UTRAN FDD- UTRAN FDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.4.4.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	12 (24dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	46		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	46		
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

Table 4.3.4.4.4.3-3: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low-r12	24		
q-RxLevMin-r12	-51 (-103 dBm)	-103 is actual value in dBm (-70 * 2 + 1 dBm)	
p-MaxUTRA-r12	21 (21 dBm)		
reducedMeasPerformance-r12	TRUE for Cell 3	If neighbouring inter-frequency cell is configured for reduced measurement performance	
}			

Table 4.3.4.4.4.3-4: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	46		

4.3.4.4.5 Test requirement

Tables 4.3.4.4.4.1-1, 4.3.4.4.5-1, 4.3.4.4.5-2 and 4.3.4.4.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD to UTRA TDD cell re-selection test case.

Table 4.3.4.4.5-1: E-UTRA Cell specific test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 1				
		T0	T1	T2	T3	T4
E-UTRA RF Channel number		1				
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50				
OCNG Patterns		5MHz: OP.10 TDD 10MHz: OP.2 TDD				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc} Note 2	dBm/15kHz	-98				
$\hat{E}_s / N_{oc}$	dB	11.05	-3.05	11.05	-3.05	11.05
$\hat{E}_s / I_{ot}$ Note 3	dB	11.05	-3.05	11.05	-3.05	11.05
RSRP Note 3	dBm/15kHz	-86.95	-101.05	-86.95	-101.05	-86.95
$Q_{rxlevmin}$	dBm/15kHz	-140				
$S_{nonintrasearch}$	dB	Not sent				
$Thresh_{serving, low}$	dB	46 (-94dBm)				
$Thresh_{x, low}$ Note 4	dB	24 (-79dBm)				
Propagation Condition		AWGN				
Antenna Configuration		1x2				

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.

Note 3: E_s/I_{ot} and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

Table 4.3.4.4.5-2: UTRA TDD Cell specific test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 2 (UTRA TDD)									
Timeslot Number		0					DwPTS				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number Note1		Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group									
PCCPCH_Ec/Ior	dB	-3									
DwPCH_Ec/Ior	dB						0				
OCNS_Ec/Ior	dB	-3									
I_{oc}	dBm/ 1.28 MHz	-80									
$\hat{I}_{or}/I_{oc}$	dB	-3	11	-3	-3	-3	-3	11	-3	-3	-3
PCCPCH RSCP	dBm	-86	-72	-86	-86	-86	n.a.				
Propagation Condition		AWGN									
$Q_{rxlevmin}$	dBm	-103									
$Qoffset1_{s,n}$	dB	C1, C2: 0									
$Qhyst1_{s}$	dB	0									
$S_{prioritysearch1}$	dB	24 (-79dBm)									
$S_{prioritysearch2}$	dB	0									
$Thresh_{x, low}$ Note2	dB	46 (-94dBm)									
$Ssearch_{E-UTRA}$	dB	Not send									
Time offset to cell1	ms	3									

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note2: This refers to the value of $Thresh_{x, low}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table 4.3.4.4.5-3:

Parameter	Unit	Cell 3 (UTRA TDD)									
Timeslot Number		0					DwPTS				
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number Note1		Randomly selected from 4, 5, 6, 7 such that cell 3 is in the reduced performance group									
PCCPCH_Ec/Ior	dB	-3									
DwPCH_Ec/Ior	dB						0				
OCNS_Ec/Ior	dB	-3									
I_{oc}	dBm/ 1.28 MHz	-80									
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	11	-3	-3	-3	-3	11	-3
PCCPCH RSCP	dBm	-86	-86	-86	-72	-86	n.a.				
Propagation Condition		AWGN									
$Q_{rxlevmin}$	dBm	-103									
$Qoffset1_{s,n}$	dB	C1, C2: 0									
$Qhyst1_{s}$	dB	0									
$S_{prioritysearch1}$	dB	24 (-79dBm)									
$S_{prioritysearch2}$	dB	0									
$Thresh_{x, high}$ Note2	dB	46 (-94dBm)									
$Ssearch_{E-UTRA}$	dB	Not send									
Time offset to cell1	ms	3									
Time offset to cell2	µs	3									

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send the SYNCH-UL sequence in the UpPTS on cell 2, 3 for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table 4.3.4.4.5-4

Table 4.3.4.4.5-4: Test requirements for E-UTRA TDD to UTRA TDD inter-RAT cell reselection

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	58.9
T3	Cell 3 (reduced performance group)	462.1

The rate of correct cell reselections observed during repeated tests shall be at least 90%, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time with a confidence level of 95%..

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $N_{UTRA\_carrier\_TDD,normal}$ *$T_{evaluateUTRA\_TDD}$ + T_{SI_UTRA}, and to a reduced performance group cell can be expressed as: 6 * $N_{UTRA\_carrier\_TDD,reduced}$ * $T_{evaluateUTRA\_TDD}$ + T_{SI_UTRA},

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, See Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 3 * 19.2 + 1.28 = 58.88 s for normal performance group reselection and 6 * 4 * 19.2 + 1.28 = 462.08s for reduced performance group reselection, allow 58.9s for normal performance group and 462.1s for reduced performance group in the test case.

Since only one E-UTRA frequency is configured and signal level of UTRA cell is lower than threshold of $S_{prioritysearch}$, the UE shall select back to cell 1 (E-UTRA cell) within $K_{carrier}$ * $T_{evaluateEUTRA}$ + T_{SI} = 19.2 + 1.28 = 20.48s.

4.4 E-UTRAN to GSM Cell Re-Selection

4.4.1 E-UTRAN FDD - GSM cell re-selection

4.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

4.4.1.3 Minimum conformance requirements

The cell re-selection delay shall be less than 4 * $T_{measure,\ GSM}$ + T_{BCCH} in RRC_IDLE state.

When the measurement rules defined in TS 36.304 [6] indicates that E-UTRAN inter-frequencies or inter-RAT frequency cells are to be measured, the UE shall measure the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell, GSM BCCH carriers of lower priority than the serving cell shall be measured at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3.

When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority

search, it is determined that re-selection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

However, the minimum measurement filtering requirements specified shall still be met by the UE before it makes any determination that it may stop measuring the cell.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

The UE shall evaluate the inter-RAT cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $Treselection_{EUTRAN}$ is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $Treselection_{EUTRAN}$ timer.

At inter-RAT cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For E-UTRAN to GSM cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms. T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in TS 45.008 [15] clause 6.2.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 32 GSM carriers

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells) , cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.1.

4.4.1.4 Test description

4.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.4.1.4.3.
5. There is one E-UTRA FDD cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.4.1.4.1-1: General Test Parameters for E-UTRAN FDD - GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA FDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA FDD carrier frequency
GSM ARFCN			1	12 GSM BCCH carriers are used
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
CP length of cell 1			Normal	
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.
Propagation channel			AWGN	

4.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cells on one E-UTRA FDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 (E-UTRA FDD cell) and Cell 2 (GSM cell) shall belong to different Location Areas. During initialization before the start of the test, the UE is camped on Cell 1. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion during T1. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA FDD layer.

In the following test procedure “UE responds” means “UE starts transmitting RR Channel Request message for location update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table’s 4.4.1.5-1 and 4.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table’s 4.4.1.5-1 and 4.4.1.5-2.
6. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 27.9 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.4.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-1

All GSM cell messages indicated shall use the same content as described in the default message content in TS 45.008 [15] clause 9 for Rel-4 and later releases, with the exceptions above and as specified in Tables 4.4.1.5-1 and 4.4.1.5-2.

4.4.1.5 Test requirement

Tables 4.4.1.4.1-1, 4.4.1.5-1 and 4.4.1.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM cell re-selection test case.

Table 4.4.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s / I_{ot}$	dB	10.5	-3.70
$\hat{E}_s / N_{oc}$	dB	10.5	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ Note 2	dB	24	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.

Table 4.4.1.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay test requirement in this case is expressed as:

Cell re-selection delay = 4 * $T_{measureGSM}$ + T_{BCCH}

$T_{measureGSM}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3

T_{BCCH} = 1.9 s; maximum time allowed to read the BCCH data from GSM cell, when being synchronized to a BCCH carrier; as specified in TS 45.008 [15] clause 6.2

The cell re-selection delay shall be less than a total of 27.9 seconds in this test case (note: this gives a total of 26 seconds for the $T_{measureGSM}$ calculation plus 1.9 s for T_{BCCH} but the test allows 27.9 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.4.2 E-UTRAN TDD - GSM cell re-selection

4.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

4.4.2.3 Minimum conformance requirements

If the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure GSM cells if the priority of GSM is equal to, or lower than the serving cell.

- The UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall measure, according to the measurement rules defined in TS 36.304 [6] at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3:

- If a detailed neighbour cell list is provided, the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell; or

- If only BCCH carriers are provided, the signal level of the GSM BCCH carriers indicated in the measurement control system information of the serving cell

If the RSRP of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for GSM BCCH carrier at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies. When

higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If re-selection to any higher priority cell is not triggered within (4 * $T_{measure\_GSM}$ + $Treselection_{RAT}$) after it has been found in a higher priority search, the UE is not required to continue make measurements of the BCCH carrier to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.2.

4.4.2.4 Test description

4.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.4.2.4.3.

5. There is one E-UTRA TDD cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.4.2.4.1-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA TDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA TDD carrier frequency
GSM ARFCN			1	12 GSM BCCH carriers are used
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration for cell 1			6	As specified in table 4.2.1 in TS 36.211
PRACH configuration for cell 1			53	As specified in table 5.7.1-3 in TS 36.211
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
Propagation channel			AWGN	
T1		s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.

4.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 (E-UTRA TDD cell) and Cell 2 (GSM cell) belong to different Location Areas. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA TDD layer.

In the following test procedure “UE responds” means “UE starts transmitting RR Channel Request message for location update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table’s 4.4.2.5-1 and 4.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table’s 4.4.2.5-1 and 4.4.2.5-2.
6. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 27.9 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.4.2.4.3 Message contents

Message contents are according to TS 36.508 [4] clause 4.6 with the following exceptions:

Table 4.4.2.4.3-1: Common Exception messages for E-UTRAN TDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-2

All GSM cell messages indicated shall use the same content as described in the default message content in TS 45.008 [15] clause 9 for Rel-4 and later releases, with the exceptions above and as specified in Tables 4.4.2.5-1 and 4.4.2.5-2.

4.4.2.5 Test requirement

Tables 4.4.2.4.1-1, 4.4.2.5-1 and 4.4.2.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM cell re-selection test case.

Table 4.4.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$Q_{rxlevmin}$	dBm	-140	
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s / I_{ot}$	dB	10.5	-3.70
$\hat{E}_s / N_{oc}$	dB	10.5	-3.70
$T_{reselectionEUTRAN}$	s	0	
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	24	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.

Table 4.4.2.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay test requirement in this case is expressed as:

Cell re-selection delay = 4 * TmeasureGSM + T_{BCCH}

TmeasureGSM = 6.4 s; as specified in TS 36.133 [4] Table 4.2.2.5.3-1 in clause 4.2.2.5.3

T_{BCCH} = 1.9 s; the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier as specified in TS 45.008 [15] clause 6.2

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

The cell re-selection delay shall be less than a total of 27.9 seconds in this test case (note: this gives a total of 26 seconds for the $T_{measureGSM}$ calculation plus 1.9 s for T_{BCCH} but the test allows 27.9 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.5 E-UTRAN to HRPD Cell Re-Selection

4.5.1 E-UTRAN FDD - HRPD Cell re-selection

4.5.1.1 E-UTRAN FDD - HRPD Cell Reselection: HRPD is of Lower Priority

4.5.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring HRPD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.5.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD.

4.5.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter ‘Number of HRPD Neighbour Frequency’, which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than ‘HRPD Start Measuring E-UTRAN Rx Power Strength Threshold’ and HRPD is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure CDMA2000 HRPD Pilot Strength of the HRPD cells at least every (Number of HRPD Neighbour Frequency)*$T_{measureHRPD}$. In case HRPD is of higher priority than the currently selected E-

UTRAN frequency layer the UE shall measure HRPD cells at least every (Number of HRPD Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the HRPD cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateHRPD}$.

Table 4.2.2.5.4-1 of TS 36.133 [4] clause 4.2.2.5.4 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$

4.5.1.1.4 Test description

4.5.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.5.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.5.1.1.4.3

5. There is one E-UTRA FDD cell and one HRPD cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table4.5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority HRPD Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one HRPD cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

2. Set the parameters according to T1 in Tables 4.5.1.1.5-1 and 4.5.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts

3. When T1 expires the SS shall switch the power setting from T1 to T2 as specified in Tables 4.5.1.1.5-1 and 4.5.1.1.5-2.

4. The SS waits for probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.

5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.5.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions:

Table 4.5.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-11 Table H.2.3-12
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.5.1.1.5 Test requirement

Tables 4.5.1.1.5-1 and 4.5.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD cell re-selection test (HRPD cell is of lower priority).

Table 4.5.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s / I_{ot}$	dB	10.5	-3.7
$\hat{E}_s / N_{oc}$	dB	10.5	-3.7
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51.1	36.9
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 4.5.1.1.5-2: Cell Specific Test Parameters for HRPD (cell # 2)

Parameter	Unit	Cell 2	
		T1	**T2**
HRPD RF Channel Number		1	
$\frac{Control \quad E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{Control \quad E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or} / I_{oc}$	dB	0	0
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		-6	
Treselection	s	0	
hrpd-CellReselectionPriority	-	0	
$Thresh_{x, low}$		-14	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI-HRPD}$

Where:

$T_{evaluatHRPD}$ 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.4-1

$T_{SI-HRPD}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.5.2 E-UTRAN TDD - HRPD Cell re-selection

4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority

4.5.2.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring HRPD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.5.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD.

4.5.2.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of HRPD Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'HRPD Start Measuring E-UTRAN Rx Power Strength Threshold' and HRPD is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure CDMA2000 HRPD Pilot Strength of the HRPD cells at least every (Number of HRPD Neighbour Frequency)*$T_{measureHRPD}$. In case HRPD is of higher priority than the currently selected E-UTRAN frequency layer the UE shall measure HRPD cells at least every (Number of HRPD Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the HRPD cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateHRPD}$.

Table 4.2.2.5.4-1 of TS 36.133 [4] clause 4.2.2.5.4 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.4 and A.4.5.2.1.

4.5.2.1.4 Test description

4.5.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.5.2.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.5.2.1.4.3

5. There is one E-UTRA TDD cell and one HRPD cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.5.2.1.4.1-1: General Test Parameters for E-UTRAN TDD - lower priority HRPD Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1			Normal	
DRX cycle length		s	1.28	
E-UTRA TDD RF Channel Number			1	Only one TDD carrier frequency is used.
E-UTRA TDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA TDD PRACH configuration of cell 1			53	As specified in table 4.7.1-3 in TS 36.211
E_UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.5.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one HRPD cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN TDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.5.2.1.5-1 and 4.5.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts
3. When T1 expires the SS shall switch the power setting from T1 to T2 as specified in Tables 4.5.2.1.5-1 and 4.5.1.1.5-2.
4. The SS waits for probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.5.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions:

Table 4.5.2.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-11 Table H.2.3-12
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.5.2.1.5 Test requirement

Tables 4.5.2.1.5-1 and 4.5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD cell re-selection test (HRPD cell is of lower priority).

Table 4.5.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s / I_{ot}$	dB	10.5	-3.7
$\hat{E}_s / N_{oc}$	dB	10.5	-3.7
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51.1	36.9
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 4.5.2.1.1-3: Cell Specific Test Parameters for HRPD (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
HRPD RF Channel Number		1	
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0	0
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		-6	
Treselection	s	0	
hrpd-CellReselectionPriority	-	0	
$Thresh_{x, low}$		-14	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI-HRPD}$

Where:

$T_{evaluatHRPD}$ 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.4-1

$T_{SI-HRPD}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.6 E-UTRAN to cdma2000 1xRTT Cell Re-Selection

4.6.1 E-UTRAN FDD - cdma2000 1xRTT Cell re-selection

4.6.1.1 E-UTRAN FDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The intra-frequency cell reselection criteria related to scaling of measurement rules parameters need to be specified when parameters are finalized

The intra-frequency cell reselection criteria related to exact scaling parameters for different mobility states are undefined

Measurement bandwidth (current assumption is 6RB) is undefined

The "out of service" criteria is undefined

The transmission scheme (1Tx or 2Tx) undefined

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined, including uncertainties above 3GHz

Test tolerances have not yet been applied to the wanted and interfering signal levels

4.6.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring cdma2000 1xRTT cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the cdma2000 1x is of lower priority.

4.6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT.

4.6.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'CDMA2000 1X Start Measuring E-UTRAN Rx Power Strength Threshold' and cdma2000 1X is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure Pilot Ec/Io of the CDMA2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)*$T_{measureCDMA2000\ 1X}$. In case cdma2000 1X is of higher priority than the currently selected E-UTRAN frequency layer, the UE shall measure cdma2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateCDMA2000\ 1X}$.

Table 4.2.2.5.5-1 of TS 36.133 [4] clause 4.2.2.5.5 gives values of $T_{measureCDMA2000\ 1X}$ and $T_{evaluateCDMA2000\ 1X.}$

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.5 and A.4.6.1.1.

4.6.1.1.4 Test description

4.6.1.1.4.1 Initial conditions

Test Environment: Normal as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 4.6.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.6.1.1.4.3

5. There is one E-UTRA FDD cell and one CDMA2000 1xRTT cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.6.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority cdma2000 1X Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.6.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one CDMA200 1xRTT cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and CDMA2000 1xRTT cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.6.1.1.5-1 and 4.6.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 4.6.1.1.5-1 and 4.6.1.1.5-2.
4. The SS waits for access probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.6.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.6.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-15 Table H.2.3-16
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.6.1.1.5 Test requirements

Tables 4.6.1.1.5-1 and 4.6.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT cell re-selection test (cdma2000 1x cell is of lower priority).

Table 4.6.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-89+ TT	-100+ TT
$\hat{E}_s / I_{ot}$	dB	9+ TT	-2+ TT
$\hat{E}_s / N_{oc}$	dB	9	-2
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	40
$Thresh_{serving, low}$	dB	43	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.6.1.1.5-2: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	[-7]	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	[-16]	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	[-12]	
$\hat{I}_{or}/I_{oc}$	dB	[0] + TT	[0] + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10] + TT	[-10] + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		[-20]	
Treselection	s	0	
oneXRTT-CellReselectionPriority	-	0	
$Thresh_{x, low}$		[-28]	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000\ 1X} + T_{SI\text{-}cdma2000\ 1X}$

Where:

$T_{evaluatcdma2000\ 1X}$ = 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.5-1

$T_{SI\text{-}cdma2000\ 1X}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.6.2 E-UTRAN TDD - cdma2000 1xRTT Cell re-selection

4.6.2.1 E-UTRAN TDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined, including uncertainties above 3GHz

Test tolerances have not yet been applied to the wanted and interfering signal levels

4.6.2.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring cdma2000 1xRTT cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the cdma2000 1x is of lower priority.

4.6.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support cdma2000 1xRTT.

4.6.2.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'CDMA2000 1X Start Measuring E-UTRAN Rx Power Strength Threshold' and cdma2000 1X is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure Pilot Ec/Io of the CDMA2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)*$T_{measureCDMA2000\ 1X}$. In case cdma2000 1X is of higher priority than the currently selected E-UTRAN frequency layer, the UE shall measure cdma2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateCDMA2000\ 1X}$.

Table 4.2.2.5.5-1 of TS 36.133 [4] clause 4.2.2.5.5 gives values of $T_{measureCDMA2000\ 1X}$ and $T_{evaluateCDMA2000\ 1X.}$

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.5 and A.4.6.2.1.

4.6.2.1.4 Test description

4.6.2.1.4.1 Initial conditions

Test Environment: Normal as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure TBD for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 4.6.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.6.2.1.4.3.
5. There is one E-UTRA TDD cell and one CDMA2000 1xRTT cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.6.2.1.4.1-1: General Test Parameters for E-UTRAN TDD - lower priority cdma2000 1X Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA TDD RF Channel Number			1	Only one TDD carrier frequency is used.
E-UTRA TDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.

E-UTRA TDD PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
E_UTRA TDD Access Barring Information	-	Not Sent	No additional delays in random access procedure.
T1	s	30	
T2	s	30	

4.6.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one CDMA200 1xRTT cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN TDD cell 1 and CDMA2000 1xRTT cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.6.2.1.5-1 and 4.6.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 4.6.2.1.5-1 and 4.6.2.1.5-2.
4. The SS waits for access probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.6.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.6.2.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-15 Table H.2.3-16
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.6.2.1.5 Test requirements

Tables 4.6.2.1.5-1 and 4.6.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - cdma2000 1xRTT cell re-selection test (cdma2000 1x cell is of lower priority).

Table 4.6.2.1.5-1: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-89+TT	-102+TT
$\hat{E}_s / I_{ot}$	dB	9+TT	-4+TT
$\hat{E}_s / N_{oc}$	dB	9	-4
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	38
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	

Note 1: CNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: SRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.6.2.1.5-2: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	[-7]	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	[-16]	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	[-12]	
$\hat{I}_{or}/I_{oc}$	dB	[0] + TT	[0] + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10] + TT	[-10] + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		[-20]	
Treselection	s	0	
oneXRTT-CellReselectionPriority	-	0	
$Thresh_{x, low}$		[-28]	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000\ 1X} + T_{SI\text{-}cdma2000\ 1X}$

Where:

$T_{evaluatcdma2000\ 1X}$ = 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.5-1

$T_{SI\text{-}cdma2000\ 1X}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5 E-UTRAN RRC_CONNECTED State Mobility

When the UE is in RRC_CONNECTED state on a cell, network-controlled UE-assisted handovers are performed. The UE makes measurements of attributes of the serving and neighbour cells to enable the handover process. This process allows the UE to transfer a connection between the UE and current cell to target cell.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Due to the undefined UE behaviour regarding the sending of HARQ-ACK after receiving a RRC message triggering an handover (acc. 3GPP TS 36.331 [5] Subclause 5.3.5.4), the SS behaviour when waiting for the appropriate HARQ acknowledgement should be as follows:

- Reception of an HARQ-ACK will cause no HARQ delay exclusion (acc. subclause 3A.1).
- Reception of an HARQ-NACK will cause HARQ retransmission and HARQ delay exclusion (acc. subclause 3A.1).
- UE-DTX (as observed by SS) will cause HARQ retransmission, but no HARQ delay exclusion (acc. subclause 3A.1).

Uplink for E-UTRA cell(s) is configured according to Annex A.3.

5.1 E-UTRAN Handover

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case

5.1.1.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

5.1.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.1

5.1.1.4 Test description

5.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.1.1.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3

Table 5.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.1.4.3-3: MeasResults: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 5.1.1.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.1.5 Test requirement

Tables 5.1.1.4.1-1 and 5.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.2 E-UTRAN TDD-TDD Handover intra frequency case

5.1.2.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

5.1.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.2.

5.1.2.4 Test description

5.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.2.4.1-1: General Test Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in Annex A.1.2
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in Annex A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.2.1.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3

Table 5.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.2.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.2.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			

5.1.2.5 Test requirement

Tables 5.1.2.4.1-1 and 5.1.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Intra Frequency Handover test.

Table 5.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note]	dB						
OCNG_RB[Note]	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

T_{search} = 0, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.3 E-UTRAN FDD-FDD Handover inter frequency case

5.1.3.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, 13, and 25.

5.1.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.2.1.

5.1.3.4 Test description

5.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.3.4.3.

5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.3.5-2
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells		3	ms	Asynchronous cells 3ms or 92160*Ts
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.3.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3 Table H.3.6-2

Table 5.1.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.3.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.3.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.3.5 Test requirement

Tables 5.1.3.4.1-1, 5.1.3.5-1, and 5.1.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover test case.

Table 5.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-90.5	-90.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.1.3.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.3_2 E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis

5.1.3_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.3_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 5, 13, and 25.

5.1.3_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.3.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1, A.5.1.3 and A.3.22.

5.1.3_2.4 Test description

5.1.3_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.3.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.3_2.4.1-1.

Table 5.1.3_2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover for UE category 1bis test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in clause TS 36.133 [4] A.3.3
PRACH configuration			4	As specified in Table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.3_2.4.2 Test procedure

Same initial conditions as in clause 5.1.3.4.2 with the following exceptions:

- Instead of Table 5.1.3.5-1 → use Table 5.1.3_2.5-1.

5.1.3_2.4.3 Message contents

Same message contents as in clause 5.1.3.4.3.

5.1.3_2.5 Test requirement

Tables 5.1.3.4.1-1 and 5.1.3_2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis test case.

Table 5.1.3_2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover for UE category 1bis test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Antenna Configuration		1x1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.4 E-UTRAN TDD-TDD Handover inter frequency case

5.1.4.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, 13, and 25.

5.1.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.4

5.1.4.4 Test description

5.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.4.4.3.
5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.4.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two TDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.4.5-2
CP length			Normal	
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information		-	Not sent	No additional delays in random access procedure
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
Time offset between cells		μs	3	Synchronous cells 3μs or 92*Ts
Gap pattern configuration Id			1	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

Table 5.1.4.4.1-2: Void

5.1.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.4.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.4.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.4.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.4.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3 Table H.3.6-2

Table 5.1.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.4.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.4.5 Test requirement

Tables 5.1.4.4.1-1 and 5.1.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Inter Frequency Handover test.

Table 5.1.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Inter Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in TS 36.133 [4] D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note]	dB						
OCNG_RB[Note]	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7.50	7.50
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7.50	7.50
RSRP	dBm/15 KHz	-94	-94	-94	- Infinity	-90.5	-90.5
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

Table 5.1.4.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.4_2 E-UTRAN TDD-TDD Handover inter frequency case for UE Category 1bis

5.1.4_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.4_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 5, 13, and 25.

5.1.4_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4, A.5.1.4 and A.3.22.

5.1.4_2.4 Test description

5.1.4_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.4.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.4_2.4.1-1.

Table 5.1.4_2.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency handover for UE category 1bis test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Gap Pattern Id			1	As specified in TS 36.133 [4] clause 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two TDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211 [9]
PRACH configuration			53	As specified in Table 5.7.1-3 in TS 36.211 [9]
Time offset between cells			3 μs	Synchronous cells
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.4_2.4.2 Test procedure

Same initial conditions as in clause 5.1.4.4.2 with the following exceptions:

- Instead of Table 5.1.4.5-1 → use Table 5.1.4_2.5-1.

5.1.4_2.4.3 Message contents

Same message contents as in clause 5.1.4.4.3.

5.1.4_2.5 Test requirement

Tables 5.1.4_2.4.1-1 and 5.1.4_2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Inter Frequency Handover for UE category 1bis test.

Table 5.1.4_2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD Inter Frequency Handover for UE category 1bis test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in TS 36.133 [4] D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{oc}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-infinity	-91	-91
Propagation Condition		AWGN					
Antenna Configuration		1x1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.5 E-UTRAN FDD-FDD inter frequency Handover: unknown target cell

5.1.5.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover: unknown target cell is commanded by meeting the handover to an unknown target cell delay requirements.

5.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 13, and 25.

5.1.5.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then Tsearch = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.5.

5.1.5.4 Test description

5.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.5.4.3.

5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.5.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
T1		s	≤5	
T2		s	1	

5.1.5.4.2 Test procedure

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables 5.1.5.4.1-1 and 5.1.5.5-1. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and start to transmit the PRACH to Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.5.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.5.5-1. T2 starts.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.5.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.3.2-3

Table 5.1.5.4.3-2: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.5.5 Test requirement

Tables 5.1.5.4.1-1 and 5.1.5.5-1define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test.

Table 5.1.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$ (note: the target cell is unknown)

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

T_{search} = 80, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.5_2 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell for UE Category 1bis

5.1.5_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover: unknown target cell is commanded by meeting the handover to an unknown target cell delay requirements.

5.1.5_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 13 and 25.

5.1.5_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.5.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1, A.5.1.5 and A.3.22.

5.1.5_2.4 Test description

5.1.5_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.5.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.5_2.4.1-1.

Table 5.1.5_2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell for UE category 1bis test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
PRACH configuration			4	As specified in Table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
T1		s	≤5	
T2		s	1	

5.1.5_2.4.2 Test procedure

Same initial conditions as in clause 5.1.5.4.2 with the following exceptions:

- Instead of Table 5.1.5.5-1 → use Table 5.1.5_2.5-1.

5.1.5_2.4.3 Message contents

Same message contents as in clause 5.1.5.4.3.

5.1.5_2.5 Test requirement

Tables 5.1.5_2.4.1-1 and 5.1.5_2.5-1define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover: unknown target cell for UE category 1bis test.

Table 5.1.5_2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell for UE category 1bis test case

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91
Propagation Condition		AWGN			
Antenna Configuration		1x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$ (note: the target cell is unknown)

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

T_{search} = 80, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.6 E-UTRAN TDD-TDD inter frequency handover: unknown target cell

5.1.6.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when the target cell is unknown and an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 13, and 25.

5.1.6.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$.

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.6

5.1.6.4 Test description

5.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.6.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.6.4.3.

5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.6.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells 3μs or 92*Ts
Gap pattern configuration			-	No gap pattern configured
T1		s	≤5	
T2		s	1	

5.1.6.4.2 Test procedure

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables 5.1.6.4.1-1 and 5.1.6.5-1. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.6.5-1. T2 starts.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency handover unknown target cell test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2 Table H.3.2-3

Table 5.1.6.4.3-2: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.6.5 Test requirement

Tables 5.1.6.4.1-1 and 5.1.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown.

Table 5.1.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1(OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	5
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	5
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms (note: the target cell is unknown)

T_{search} = 80 ms, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.6_2 E-UTRAN TDD-TDD inter frequency handover: unknown target cell for UE Category 1bis

5.1.6_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when the target cell is unknown and an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.6_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 13 and 25.

5.1.6_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.6.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4, A.5.1.6 and A.3.22.

5.1.6_2.4 Test description

5.1.6_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.6.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.6_2.4.1-1.

Table 5.1.6_2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown for UE category 1bis

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211 [9]
PRACH configuration			53	As specified in Table 5.7.1-3 in TS 36.211 [9]
Time offset between cells			3 μs	Synchronous cells
Gap pattern configuration			-	No gap pattern configured
T1		s	≤5	
T2		s	1	

5.1.6_2.4.2 Test procedure

Same initial conditions as in clause 5.1.6.4.2 with the following exceptions:

- Instead of Table 5.1.6.5-1 → use Table 5.1.6_2.5-1.

5.1.6_2.4.3 Message contents

Same message contents as in clause 5.1.6.4.3.

5.1.6_2.5 Test requirement

Tables 5.1.6_2.4.1-1 and 5.1.6_2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown.

Table 5.1.6_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown for UE category 1bis

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1(OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	5
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	5
Propagation Condition		AWGN			
Antenna Configuration		1x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms (note: the target cell is unknown)

T_{search} = 80 ms, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.7 E-UTRAN FDD-TDD Handover inter frequency case

5.1.7.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN FDD-TDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.7.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5, 25, and 30.

5.1.7.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] section 5.2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Section 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.7

5.1.7.4 Test description

5.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.1.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.7.4.3.
5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and E-UTRA TDD Cell 2 on each carrier specified in the test. E-UTRA FDD Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.7.4.1-1: General Test Parameters for E-UTRAN FDD-TDD inter frequency handover test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One FDD carrier is used
Cell 2 E-UTRA RF channel number			2	One TDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in 3GPP TS 36.133 [4] section A.3.3
CP length			Normal	
E-UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 2.
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 2
E-UTRA TDD PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset between cells			3 ms	Asynchronous cells
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.7.4.2 Test procedure

The test scenario comprises of one E-UTRA FDD cell and one E-UTRA TDD cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.7.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.7.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.7.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.7.4.3-1: Common Exception messages for E-UTRAN FDD-TDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3 Table H.3.6-2

Table 5.1.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.7.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.7.5 Test requirement

Tables 5.1.7.4.1-1 and 5.1.7.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD Inter Frequency Handover test.

Table 5.1.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (cell #1) in E-UTRAN FDD-TDD Inter Frequency Handover test case

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	4.00	4.00	4.00
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4.00	4.00	4.00
RSRP Note 3	dBm/15 KHz	-94.00	-94.00	-94.00
Propagation Condition	AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

Table 5.1.7.5-2: Cell specific test parameters for E-UTRAN TDD (cell #2) in E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			

$\hat{E}_s / I_{ot}$	dB	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-Infinity	-90.50	-90.50
Propagation Condition	AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.7_2 E-UTRAN FDD – TDD Inter frequency handover for UE Category 1bis

5.1.7_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN FDD-TDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.7_2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 5, 25, and 30.

5.1.7_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.7.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.2, 5.2.2.4, A.5.1.7 and A.3.22.

5.1.7_2.4 Test description

5.1.7_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.7.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.7_2.4.1-1.

Table 5.1.7_2.4.1-1: General Test Parameters for E-UTRAN FDD-TDD inter frequency handover for UE category 1bis test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			0	As specified in TS 36.133 [4] clause 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One FDD carrier is used
Cell 2 E-UTRA RF channel number			2	One TDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
CP length			Normal	
E-UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211 [9]. Applicable to cell 2.
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211 [9]. Applicable to cell 2
E-UTRA TDD PRACH configuration			53	As specified in Table 5.7.1-3 in TS 36.211 [9]
Time offset between cells			3 ms	Asynchronous cells
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.7_2.4.2 Test procedure

Same initial conditions as in clause 5.1.7.4.2 with the following exceptions:

- Instead of Table 5.1.7.5-1 → use Table 5.1.7_2.5-1.

5.1.7_2.4.3 Message contents

Same message contents as in clause 5.1.7.4.3.

5.1.7_2.5 Test requirement

Tables 5.1.7_2.4.1-1, 5.1.7_2.5-1 and 5.1.7_2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-TDD Inter Frequency Handover for UE category 1bis test.

Table 5.1.7_2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (cell #1) in E-UTRAN FDD-TDD Inter Frequency Handover for UE category 1bis test case

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	4	4	4
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4	4	4
RSRP Note 3	dBm/15 KHz	-94	-94	-94
Propagation Condition		AWGN		
Antenna Configuration		1x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

Table 5.1.7_2.5-2: Cell specific test parameters for E-UTRAN TDD (cell #2) in E-UTRAN FDD-TDD Inter frequency handover for UE category 1bis test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	-Infinity	7	7
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-Infinity	-91	-91
Propagation Condition	AWGN			
Antenna Configuration	1x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

T_{search} = 0, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.8 E-UTRAN TDD-FDD Handover inter frequency case

5.1.8.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN TDD-FDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.8.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5, 25, and 30.

5.1.8.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] section 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Section 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.8.

5.1.8.4 Test description

5.1.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.1.8.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.8.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.8.4.1-1: General Test Parameters for E-UTRAN TDD-FDD inter frequency handover test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One TDD carrier is used
Cell 2 E-UTRA RF channel number			2	One FDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in TS 36.133 [4] section A.3.3
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA FDD Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.8.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.8.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.8.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.8.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3 Table H.3.6-2

Table 5.1.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.8.4.3-3: *MeasResults*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.8.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.8.5 Test requirement

Tables 5.1.8.4.1-1, 5.1.8.5-1, and 5.1.8.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter frequency handover test case.

Table 5.1.8.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD (cell #1) in TDD-FDD Inter frequency handover test case

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	4.00	4.00	4.00
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4.00	4.00	4.00
RSRP Note 3	dBm/15 KHz	-94.00	-94.00	-94.00
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

Table 5.1.8.5-2: Cell specific test parameters for E-UTRAN FDD (cell #2) in E-UTRAN TDD-FDD Inter frequency handover test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-Infinity	-90.50	-90.50
Propagation Condition	AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.8_2 E-UTRAN TDD – FDD Inter frequency handover for UE Category 1bis

5.1.8_2.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN TDD-FDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.8_2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 5, 25, and 30.

5.1.8_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.8.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.3, 5.1.2.1, A.5.1.8 and A.3.22.

5.1.8_2.4 Test description

5.1.8_2.4.1 Initial conditions

Same initial conditions as in clause 5.1.3.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.8_2.4.1-1.

Table 5.1.8_2.4.1-1: General Test Parameters for E-UTRAN TDD-FDD inter frequency handover for UE category 1bis test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One TDD carrier is used
Cell 2 E-UTRA RF channel number			2	One FDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
E-UTRA FDD PRACH configuration			4	As specified in Table 5.7.1-2 in TS 36.211 [9]
E-UTRA FDD Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.8_2.4.2 Test procedure

Same initial conditions as in clause 5.1.8.4.2 with the following exceptions:

- Instead of Table 5.1.8.5-1 → use Table 5.1.8_2.5-1.

5.1.8_2.4.3 Message contents

Same message contents as in clause 5.1.8.4.3.

5.1.8_2.5 Test requirement

Tables 5.1.8_2.4.1-1, 5.1.8_2.5-1, and 5.1.8_2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter frequency handover for UE category 1bis test case.

Table 5.1.8_2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD (cell #1) in TDD-FDD Inter frequency handover for UE category 1bis test case

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	4	4	4
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4	4	4
RSRP Note 3	dBm/15 KHz	-94	-94	-94
Propagation Condition		AWGN		
Antenna Configuration		1x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

Table 5.1.8_2.5-2: Cell specific test parameters for E-UTRAN FDD (cell #2) in E-UTRAN TDD-FDD Inter frequency handover for UE category 1bis test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	-Infinity	7	7
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-Infinity	-91	-91
Propagation Condition	AWGN			
Antenna Configuration	1x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth

5.1.9.1 Test purpose

Same test purpose as in clause 5.1.1.

5.1.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N.

5.1.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.1.3 with the following exceptions:

- Instead of A.5.1.1 → use A.5.1.9.

5.1.9.4 Test description

5.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 5.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 5.1.1.4.1-1 for other general test parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2			

5.1.9.4.2 Test procedure

Same test procedure as in clause 5.1.1.4.2 with the following exceptions:

- Instead of Table 5.1.1.5-1 → use Table 5.1.9.5-1.

5.1.9.4.3 Message contents

Same message contents as in clause 5.1.1.4.3.

5.1.9.5 Test requirement

Same test requirement as in clause 5.1.1.5 with the following exceptions:

Tables 5.1.9.4.1-1 and 5.1.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth.

Table 5.1.9.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD	OP.16 FDD	OP.16 FDD	OP.15 FDD
Note: See Table 5.1.1.5-1 for other cell-specific test parameters.							

5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0

5.1.10.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

5.1.10.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

> $D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

> T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.10

5.1.10.4 Test description

5.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.10.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.10.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.10.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.10.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.10.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.10.4.3 Message contents

Same message content as in clause 5.1.1.4.3.

5.1.10.5 Test requirement

Tables 5.1.10.4.1-1 and 5.1.10.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0

5.1.11.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

5.1.11.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.5 and A.5.1.11.

5.1.11.4 Test description

5.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.11.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.11.4.1-1: General Test Parameters for E-UTRAN HD-FDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.2.3
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.11.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.11.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.11.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table [H.3.2-3] implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.11.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.11.4.3 Message contents

Same message content as in clause 5.1.1.4.3.

5.1.11.5 Test requirement

Tables 5.1.11.4.1-1 and 5.1.11.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD-HD-FDD intra frequency handover test case.

Table 5.1.11.5-1: Cell Specific Test requirement Parameters for E-UTRAN HD-FDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86+TT
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0

5.1.12.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE Category 0.

5.1.12.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.12.

5.1.12.4 Test description

5.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.12.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.12.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.12.4.1-1: General Test Parameters for E-UTRAN TDD-TDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [9]
Time offset between cells		S	3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

5.1.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.12.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.12.1.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.12.4.3 Message contents

Same message content as in clause 5.1.2.4.3.

5.1.12.5 Test requirement

Tables 5.1.12.4.1-1 and 5.1.12.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency handover test case.

Table 5.1.12.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.13 E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

5.1.13.1 Test purpose

To verify a CEModeA UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.13.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

5.1.13.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.1 and A.5.1.13.

5.1.13.4 Test description

5.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.13.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.13.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.13.4.1-1: General test parameters for E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.13.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.13.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.13.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.13.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 5.1.13.4.3-1: Common Exception messages for E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a with Gap Pattern Id = 1 Table H.3.1-7 Table H.3.2-3 Table H.7.1-1 Table H.7.1-2

Table 5.1.13.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.13.4.3-3:Void

Table 5.1.13.4.3-4: *MeasResults*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.13.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.13.4.3-6: *PRACH-Config-v1310-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries		
RSRP-Range[1]	34	-107dBm	
RSRP-Range[2]	42	-99dBm	
RSRP-Range[3]	49	-92dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf32		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n32		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf64		
maxNumPreambleAttemptCE-r13[3]	n5		
numRepetitionPerPreambleAttempt-r13[3]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[3]	r16		
prach-HoppingConfig-r13[3]	off		
}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf128		
maxNumPreambleAttemptCE-r13[4]	n5		
numRepetitionPerPreambleAttempt-r13[4]	n128		

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[4]	r64		
prach-HoppingConfig-r13[4]	off		
}			
}			
initial-CE-level-r13	0	INTEGER (0..3)	
}			

Table 5.1.13.4.3-7: Void

Table 5.1.13.4.3-8: *SystemInformationBlockType1-BR-r13* : Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.508 clause 4.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
freqHoppingParametersDL-r13 SEQUENCE {			
mpdcch-pdsch-HoppingNB-r13	nb2		
mpdcch-pdsch-HoppingOffset-r13	7	INTEGER (1..16 (maxAvailNarrowBands-r13))	
}			
}			

Table 5.1.13.4.3-9: *RRCConnectionReconfiguration* for eMTC HO

Derivation Path: 36.508 clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
systemInfomationBlockType1Dedicated-r11	SystemInformationBlockType1		
}			
}			
}			
}			
}			
}			
}			
}			

5.1.13.5 Test requirement

Tables 5.1.13.4.1-1 and 5.1.13.5-1 define the primary level settings including test tolerances.

Table 5.1.13.5-1: Cell specific test parameters for FDD-FDD Intra frequency handover for CE UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.1		R.21 FDD			-		
MPDCCH Reference Channel defined in clause A.7.1		R.17 FDD			R.17 FDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.1		R.7 FDD			R.7 FDD		
OCNG Patterns defined in D.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s / I_{ot}$ Note 3	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.14 E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

5.1.14.1 Test purpose

To verify a CEModeA UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

5.1.14.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

Where:

T_{search} is the time required to search the target cell the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.2 and A.5.1.14.

5.1.14.4 Test description

5.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.14.4.3.
5. There is one E-UTRA HD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.14.4.1-1: General test parameters for E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one HD-FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.14.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.14.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.14.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.14.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.14.4.3 Message contents

Same message contents as in clause 5.1.13.4.3.

5.1.14.5 Test requirement

Tables 5.1.14.4.1-1 and 5.1.14.5-1 define the primary level settings including test tolerances.

Table 5.1.14.5-1: Cell specific test parameters for E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.2		R.11 HD-FDD			-		
MPDCCH Reference Channel defined in clause A.7.2		R.7 HD-FDD			R.7 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.3		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns defined in D.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$ Note 3	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s / I_{ot}$	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells		-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.15 E-UTRAN TDD Intra frequency handover for CE UEs in CEModeA

5.1.15.1 Test purpose

To verify a CEModeA UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.15.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

5.1.15.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

Where:

T_{search} is the time required to search the target cell when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.3 and A.5.1.15.

5.1.15.4 Test description

5.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.15.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.15.4.1-1: General test parameters for E-UTRAN TDD Intra frequency handover for CE UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.15.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.15.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.15.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.15.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.15.4.3 Message contents

Same message contents as in clause 5.1.13.4.3 with following exceptions:

- Instead of Table 5.1.13.4.3-6 → use Table 5.1.15.4.3-1.
- Instead of Table 5.1.13.4.3-7 → use Table 5.1.15.4.3-2.
- Instead of Table 5.1.13.4.3-8 → use Table 5.1.15.4.3-3.

Table 5.1.15.4.3-1: *PRACH-Config-v1310-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries		
RSRP-Range[1]	34	-107dBm	
RSRP-Range[2]	42	-99dBm	
RSRP-Range[3]	49	-92dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf2		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n32		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf2		
maxNumPreambleAttemptCE-r13[3]	n5		
numRepetitionPerPreambleAttempt-r13[3]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[3]	r4		
prach-HoppingConfig-r13[3]	off		
}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf2		
maxNumPreambleAttemptCE-r13[4]	n5		
numRepetitionPerPreambleAttempt-r13[4]	n128		

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[4]	r64		
prach-HoppingConfig-r13[4]	off		
}			
}			
initial-CE-level-r13	0	INTEGER (0..3)	
}			

Table 5.1.15.4.3-2: *EPDCCH-Config-r11-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
EPDCCH-Config-r11 ::= SEQUENCE{			
config-r11{			
setup SEQUENCE {			
startSymbol-r11	2		
setConfigToReleaseList-r11	Not present		
setConfigToAddModList-r11 SEQUENCE {	1 entry		
setConfigId-r11[1]	0		
transmissionType-r11[1]	distributed		
resourceBlockAssignment-r11[1] SEQUENCE{			
numberPRB-Pairs-r11	n4		
resourceBlockAssignment-r11	1001		
}			
dmrs-ScramblingSequenceInt-r11[1]	0		
pucch-ResourceStartOffset-r11[1]	0		
re-MappingQCL-ConfigListId-r11[1]	0		
numberPRB-Pairs-v1310	Not present		
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	sf4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
tdd-r13	v1		TDD
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			
}			
}			
}			
}			

Table 5.1.15.4.3-3: *SystemInformationBlockType1-BR-r13* : Additional E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.508 clause 4.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
freqHoppingParametersDL-r13 SEQUENCE {			
mpdcch-pdsch-HoppingNB-r13	nb2		
interval-DLHoppingConfigCommonModeA-r13 CHOICE {			
interval-TDD-r13	Int10		TDD
}			
mpdcch-pdsch-HoppingOffset-r13	7	INTEGER (1..16 (maxAvailNarrowBands-r13))	
}			
}			

5.1.15.5 Test requirement

Tables 5.1.15.4.1-1 and 5.1.15.5-1 define the primary level settings including test tolerances.

Table 5.1.15.5-1: Cell specific test parameters for E-UTRAN TDD Intra frequency handover for CE UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.3		R.17 TDD			-		
MPDCCH Reference Channel defined in clause A.7.3		R.15 TDD			R.15 TDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.2		R.7 TDD			R.7 TDD		
OCNG Patterns defined in D.2.11		OP.11 TDD			OP.11 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s / I_{ot}$ Note 3	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Synchronous cells	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.16 E-UTRAN FDD-FDD Intra frequency handover for CE UEs in CEModeB

5.1.16.1 Test purpose

To verify the CEModeB UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.16.2 Test applicability

This test applies to all types of E-UTRA FDD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

5.1.16.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where:

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.1.2. The handover delay shall be less than $D_{handover.}$

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.1.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.1 and A.5.1.16.

5.1.16.4 Test description

5.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.16.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.16.4.3.
5. There is one E-UTRA FDD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.16.4.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover for CE UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			1	

5.1.16.4.2 Test procedure

The test consists of one E_UTRA FDD-FDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.16.4.1-1 and 5.1.16.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.16.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.16.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.16.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.16.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.16.4.3 Message contents

Message contents are according to clause 5.1.1.4.3.

5.1.16.5 Test requirement

Tables 5.1.16.4.1-1 and 5.1.16.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.16.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case for CE UEs in CEModeB test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel in TS 36.133 [4] A.3.1.4.4		R.23 FDD					
MPDCCH Reference Channel in TS 36.133 [4] A.3.1.3.4		R.19 FDD			R.19 FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.1		R.7 FDD			R.7 FDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	-12	-12	-12	-Infinity	-6.5	-6.5
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12.88	-12.88	-Infinity	-6.77	-6.77
RSRP Note 3	dBm/15 KHz	-110	-110	-110	-Infinity	-104.5	-104.5
Io Note 3	dBm/9MHz	-69.95	-69.12	-69.12	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.16.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms, where

$T_{search} = 0$, since Cell 2 is known prior to the test,

$T_{IU} = 15$ ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion, and

$T_{MIB} =$ 2545 ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.1.17 E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeB

5.1.17.1 Test purpose

To verify the CEModeB UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.17.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

5.1.17.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.1.2. The handover delay shall be less than $D_{handover.}$

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.1.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.2 and A.5.1.17.

5.1.17.4 Test description

5.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.17.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.17.4.3.
5. There is one E-UTRA HD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.17.4.1-1: General test parameters for E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in clause TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			2	

5.1.17.4.2 Test procedure

The test consists of one E_UTRA HD-FDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.17.4.1-1 and 5.1.17.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN

shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.17.1.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.17.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.17.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.17.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.17.4.3 Message contents

Same message content as in clause 5.1.16.4.3.

5.1.17.5 Test requirement

Tables 5.1.17.4.1-1 and 5.1.17.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD-HD-FDD intra frequency handover test case.

Table 5.1.17.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeB test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel in clause TS 36.133 [4] A.3.1.4.5		R.13 HD-FDD			-		
MPDCCH Reference Channel in clause TS 36.133 [4] A.3.1.3.5		R.9 HD-FDD			R.9 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.3		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$ Note 3	dB	-12	-12	-12	-Infinity	-6.5	-6.5
$\hat{E}_s / I_{ot}$	dB	-12	-12.88	-12.88	-Infinity	-6.77	-6.77
RSRP Note 3	dBm/15 KHz	-110	-110	-110	-Infinity	-104.5	-104.5
Io Note 3	dBm/9MHz	-69.95	-69.12	-69.12	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.17.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms, where

$T_{search} = 0$, since Cell 2 is known prior to the test,

$T_{IU} = 15$ ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion, and

$T_{MIB} = 2545$ ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.1.18 E-UTRAN TDD Intra frequency handover for CE UEs in CEModeB

5.1.18.1 Test purpose

To verify the CEModeB UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.18.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

5.1.18.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where:

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.3.2. The handover delay shall be less than $D_{handover.}$

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the availability of first available PRACH occasion based on the PRACH configuration used in the

target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.3.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.3 and A.5.1.18.

5.1.18.4 Test description

5.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.18.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.18.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.18.4.1-1: General test parameters for E-UTRAN TDD Intra frequency handover for CE UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
PRACH configuration			PRACH_4CE	As specified in clause TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			1	

5.1.18.4.2 Test procedure

The test consists of one E_UTRA TDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.18.4.1-1 and 5.1.18.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2.

Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.18.1.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.18.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.18.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.18.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.18.4.3 Message contents

Message contents are according to clause 5.1.2.4.3.

5.1.18.5 Test requirement

Tables 5.1.18.4.1-1 and 5.1.18.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency handover test case.

Table 5.1.18.5-1: Cell specific test parameters for E-UTRAN TDD Intra frequency handover test case for CE UEs in CEModeB test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Measurement Channel in clause TS 36.133 [4] A.3.1.4.6		R.19 TDD			-		
MPDCCH Reference Channel in clause TS 36.133 [4] A.3.1.3.6		R.17 TDD			R.17 TDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.2		R.7 TDD			R.7 TDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.2.11		OP.11 TDD			OP.11 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	-12	-12	-12	-Infinity	-6.5	-6.5
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12.88	-12.88	-Infinity	-6.77	-6.77
RSRP Note 3	dBm/15 KHz	-110	-110	-110	-Infinity	-104.5	-104.5
Io Note 3	dBm/9MHz	-69.95	-69.12	-69.12	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Synchronous cells	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.18.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms, where

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

$T_{MIB} = 2545$ ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.1.19 E-UTRAN FDD – FDD Intra frequency handover for UE Category 1bis

5.1.19.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.19.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

5.1.19.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command when UE is configured with normal or make-before-break handover.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH when UE is configured with normal or make-before-break handover, or the time the UE starts transmission of new PUSCH when UE is configured with RACH-less or combination of make-before-break and RACH-less handover, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH or on the new PUSCH.

When intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.19.

5.1.19.4 Test description

5.1.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.40 using only main UE Tx/Rx antenna and without fading.

2. The general test parameter settings are set up according to Table 5.1.19.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 5.1.19.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.19.4.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.19.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.19.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.19.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in [Table H.3.2-3] implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.19.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.19.4.3 Message contents

Same message content as in clause 5.1.1.4.3.

5.1.19.5 Test requirement

Tables 5.1.19.4.1-1 and 5.1.19.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra frequency handover for UE Category 1bis test case.

Table 5.1.19.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Measurement Channel in clause A.3.1.1.1		R.0 FDD	R.0 FDD	-	-	-	R.0 FDD
PCFICH/PDCCH/PHICH Reference Channel in clause A.3.1.2.1		R.6 FDD			R.6 FDD		
OCNG Patterns defined in A.3.2.1.1 and in A.3.2.1.2		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	12.50	12.50
$\hat{E}_s / I_{ot}$	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-85.50	-85.50
Io Note 3	dBm/9MHz	-61.58	- 56.57	- 56.57	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.20 E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis

5.1.20.1 Test purpose

To verify the category 1bis UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.20.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

5.1.20.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command when UE is configured with normal or make-before-break handover.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5. 2.2.4.2.1.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH when UE is configured with normal or make-before-break handover, or the time the UE starts transmission of new PUSCH when UE is configured with RACH-less or combination of make-before-break and RACH-less handover, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH or on the new PUSCH.

When intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.20.

5.1.20.4 Test description

5.1.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.40 using only main UE Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.20.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.1.20.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.20.4.1-1: General test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.20.4.2 Test procedure

Same test procedure as in clause 5.1.19.4.2 with the following exceptions:

- Instead of Table 5.1.19.5-1 → use Table 5.1.20.5-1.

5.1.20.4.3 Message contents

Same message content as in clause 5.1.2.4.3.

5.1.20.5 Test requirement

Tables 5.1.20.4.1-1 and 5.1.20.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis test case.

Table 5.1.20.5-1: Cell specific test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Measurement Channel in clause A.3.1.1.2		R.0 TDD	R.0 TDD	-	-	-	R.0 TDD
PCFICH/PDCCH/PHICH Reference Channel in clause A.3.1.2.2		R.6 TDD			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 and in A.3.2.2.2		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	- Infinity	12.50	12.50
$\hat{E}_s / I_{ot}$	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-85.50	-85.50
Io Note 3	dBm/9MHz	-61.58	- 56.57	- 56.57	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1 Asynchronous cells	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.21 to 5.1.27

5.1.28 E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA

5.1.28.1 Test purpose

To verify that a UE in CEModeA is able to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.28.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL and non-BL CE UEs.

5.1.28.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When the UE receives a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [2] plus the interruption time stated in clause 5.5.2.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover or inter-frequency handover is commanded and the field *sameSFN-Indication* and *mib-RepetitionStatus* [2] are included in the handover command then the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

When intra-frequency handover or inter-frequency handover is commanded and the field *sameSFN-Indication* or *mib-RepetitionStatus* [2] is not included in the handover command then UE the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

- T_{search} is the time required to search the target cell when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in Clause 8.13.2.1 for intra-frequency handover for a UE configured with CEModeA or T_{search} shall be according to the non-DRX cell identification requirements specified in Clause 8.13.2.6 for inter-frequency handover for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

- T_{MIB} is the time required for acquiring the MIB information of the target cell.

- T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

- In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. For intra-frequency handover the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 for CEModeA. For inter-frequency handover the time duration required for the cell identification is specified in relevant inter-frequency cell identification requirements as described in Clause 8.13.2.6 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.2 and A.5.1.28.

5.1.28.4 Test description

5.1.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.14 using only main Tx/Rx antenna and without fading.

2. The general test parameter settings are set up according to Table 5.1.28.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.28.4.3.

5. There is two E-UTRA FDD carriers and one cell in each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.28.4.1-1: General test parameters for E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1, 2	Two FDD carriers are used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.3.16
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.28.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods,

with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.28.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.28.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRCConnectionReconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.28.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 5.1.28.4.3-1: Common Exception messages for E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 with Gap Pattern Id = 1 Table H.3.1-7 Table H.3.2-3 Table H.7.1-1

Table 5.1.28.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.28.4.3-3:Void

Table 5.1.28.4.3-4: *MeasResults*: Additional E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.28.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.28.4.3-6: *PRACH-Config-v1310-DEFAULT*: Additional E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries		
RSRP-Range[1]	34	-107dBm	
RSRP-Range[2]	42	-99dBm	
RSRP-Range[3]	49	-92dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf2		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n32		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf2		
maxNumPreambleAttemptCE-r13[3]	n5		
numRepetitionPerPreambleAttempt-r13[3]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[3]	r16		
prach-HoppingConfig-r13[3]	off		
}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf2		
maxNumPreambleAttemptCE-r13[4]	n5		
numRepetitionPerPreambleAttempt-r13[4]	n128		

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[4]	r64		
prach-HoppingConfig-r13[4]	off		
}			
}			
initial-CE-level-r13	0	INTEGER (0..3)	
}			

Table 5.1.28.4.3-7: *RRCConnectionReconfiguration* for eMTC HO

Derivation Path: 36.508 clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
nonCriticalExtension ::= SEQUENCE {			
systemInfomationBlockType1Dedicated-r11	SystemInformationBlockType1		
}			
}			
}			
}			
}			
}			
}			

5.1.28.5 Test requirement

Tables 5.1.28.4.1-1 and 5.1.28.5-1 define the primary level settings including test tolerances.

Table 5.1.28.5-1: Cell specific test parameters for HD-FDD Inter frequency handover for CE UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel in clause A.3.1.4.1		R.11 HD-FDD	R.11 HD-FDD	-	-	-	R.11 HD-FDD
MPDCCH Reference Channel in clause A.3.1.3.1		R.7 HD-FDD			R.7 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause A.3.1.2.1		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns in clause A.3.2.1		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98			-98		
$\hat{E}_s / N_{oc}$	dB	-3	-3	-3	-Infinity	4	4
$\hat{E}_s / I_{ot}$ Note 3	dB	-3	-3	-3	-Infinity	4	4
RSRP Note 3	dBm/15 KHz	-101	-101	-101	-Infinity	-94	-94
Io Note 3	dBm/9MHz	-68.45	-68.45	-68.45	-Infinity	-64.76	-64.76
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90% with the confidence level of 95%.

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331.

$T_{interrupt}$ = 120 + 35 ms in the test; $T_{interrupt}$ is defined in clause 5.5.2.1.2 in TS 36.133.

This gives a total of 170 ms.

5.1.29 to 5.1.33

5.1.34 E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA without SFN acquisition

5.1.34.1 Test purpose

To verify that a UE in CEModeA is able to perform handover in RRC_CONNECTED state without SFN acquisition when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.34.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL and non-BL CE UEs.

5.1.34.3 Minimum conformance requirements

Same minimum conformance requirements as in 5.1.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.2 and A.5.1.34.

5.1.34.4 Test description

5.1.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.40 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 5.1.34.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.34.4.3.
5. There is one E-UTRA HD-FDD carrier and two cell on that carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.34.4.1-1: General test parameters for E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	

Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.3.16
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.34.4.2 Test procedure

Same test procedure as in 5.1.28 except:

10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

5.1.34.4.3 Message contents

Same message contents as in 5.1.28 except:

Table 5.1.34.4.3-1: Common Exception messages for E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA without SFN acquisition

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2A with Gap Pattern Id = 1

Table 5.1.34.4.3-2: MobilityControlInfo-HO: Additional E-UTRAN HD-FDD Intra frequency handover for CE UEs in CEModeA without SFN acquisition

Derivation Path: 36.133 Table 4.6.5-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityControlInfo-HO ::= SEQUENCE {			
sameSFN-Indication-r14	true	UE is not required to acquire *MasterInformation Block* to obtain the SFN of the target cell	
}			

5.1.34.5 Test requirement

Tables 5.1.34.4.1-1 and 5.1.34.5-1 define the primary level settings including test tolerances.

Table 5.1.34.5-1: Cell specific test parameters for HD-FDD Intra frequency handover for CE UEs in CEModeA without SFN acquisition test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Channel in clause A.3.1.4.2		R.11 HD-FDD	R.11 HD-FDD	-	-	-	R.11 HD-FDD
MPDCCH Reference Channel in clause A.3.1.3.2		R.7 HD-FDD			R.7 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause A.3.1.2.3		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns in clause A.3.2.1		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$ Note 3	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s / I_{ot}$	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	- 56.22	- 56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Synchronous cells	us	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves

The UE shall finish the transmission of all the repetitions of the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90% with the confidence level of 95%.

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331.

$T_{interrupt}$ = 35 ms in the test; $T_{interrupt}$ is defined in clause 5.5.2.1.2. in TS 36.133.

This gives a total of 50 ms.

5.2 Handover from E-UTRAN to other RATs

5.2.1 E-UTRAN FDD - UTRAN FDD handover

5.2.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.1.3 Minimum conformance requirements

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. Performance requirements for E-UTRA to UTRA soft handover are not specified. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one in-sync is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.1.

5.2.1.4 Test description

5.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.1.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	Absolute UTRAN CPICH Ec/Iothreshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.1.5-1 and 5.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.1.5-1 and 5.2.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.1.5-1 and 5.2.1.5-2.

9. If the UE transmits the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.1.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18 dB)	-18 dB is actual UTRA-Thres is actual Ec/Io value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	This is the typical value range used in UTRAN FDD tests.	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.1.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.1.5 Test requirement

Tables 5.2.1.4.1-1, 5.2.1.5-1 and 5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover test.

Table 5.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD to UTRAN FDD handover test case (Cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note]	dB			
OCNG_RB[Note]	dB			

$\hat{E}_s / I_{ot}$	dB	-1.10	-1.10	-1.10
$\hat{E}_s / N_{oc}$		-1.10	-1.10	-1.10
N_{oc}	dBm/15 kHz	-98		
RSRP Note 2	dBm/15 KHz	-99.10	-99.10	-99.10
Io Note 2	dBm/9 MHz	–67.72	-67.72	-67.72
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.2.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD cell

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS_Ec/Ior	dB	-0.941	-0.941	Note 2
$\hat{I}_{or} / I_{oc}$	dB	-infinity	-1.8	-1.8
I_{oc}	dBm/3,84 MHz	-70	-70	-70
CPICH_Ec/Io	dB	-infinity	-14	-14
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$ (note: the target cell is known)

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 140 ms for $T_{interrupt1}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.2 E-UTRAN TDD - UTRAN FDD handover

5.2.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one "in_sync" is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.2.

5.2.2.4 Test description

5.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for call setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.2.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Parameter		Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2	
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (UTRA FDD) measurement quantity			CPICH Ec/Io	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	UTRAN FDD CPICH Ec/Io threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		ms	0	
Filter coefficient			0	
CP length			Normal	Applicable to cell 1
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification period			False	Post verification is not used.
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.2.4.2 Test procedure

The test consists of one E-UTRAN TDD cell and one neighbour UTRAN FDD cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before the start of T2 to enable the monitoring of UTRAN FDD. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. During the time T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.2.2.5-1 and 5.2.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.2.5-1 and 5.2.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.2.5-1 and 5.2.2.5-2.
9. If the UE transmits the Uplink DPCCH channel to Cell 2 less than 190 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100) for next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.2.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)-			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
Threshold-RSRP	50 (-90dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18dB)	-18 dB is actual UTRA-Thres is actual Ec/NO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.2.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.2.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	This is the typical value range used in UTRAN FDD tests.	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.2.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.2.5 Test requirement

Tables 5.2.2.4.1-1, 5.2.2.5-1 and 5.2.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD handover test.

Table 5.2.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

Parameter	Unit	Cell 1 (E-UTRAN)		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.1 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note]				
OCNG_RB[Note]				

RSRP	dBm/15 kHz	-99.10	-99.10	-99.10
$\hat{E}_s / I_{oc}$	dB	-1.10	-1.10	-1.10
$\hat{E}_s / N_{oc}$	dB	-1.10	-1.10	-1.10
N_{oc}	dBm/15 kHz	-98		
Propagation Condition		AWGN		
Note: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DPCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS_Ec/Ior	dB	-0.941	-0.941	Note 2
$\hat{I}_{or} / I_{oc}$	dB	-infinity	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io	dB	-infinity	-14	-14
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$ (note: the target cell is known)

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50ms for maximum RRC procedure delay plus 140 ms for Tinterrupt1).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.3 E-UTRAN FDD - GSM handover

5.2.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, 15 and 23.

5.2.3.3 Minimum conformance requirements

The handover delay given in table 5.2.3.3-1 and interruption time given in table 5.2.3.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.3.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-2.

Table 5.2.3.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.3.

5.2.3.4 Test description

5.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.3.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.3.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measurement quantity			GSM Carrier RSSI	
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		s	20	
T2		s	7	
T3		s	1	

5.2.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.3.5-1 and 5.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.3.5-1 and 5.2.3.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.3.5-2. T3 starts.
9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.3.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-6 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.3.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.3.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.3.4.3-4: *MeasResults*: Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.3.4.3-5: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

5.2.3.5 Test requirement

Tables 5.2.3.4.1-1, 5.2.3.5-1 and 5.2.3.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover test case.

Table 5.2.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1, T2	T3
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s / I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)	
$\hat{E}_s / N_{oc}$	dB	4	

RSRP Note 3	dBm/15kHz	-94
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.3.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{Handover\ delay}$ test requirement in this case is expressed as:

Handover delay $T_{Handover\ delay}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.29 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.4 E-UTRAN TDD - UTRAN TDD handover

5.2.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.4.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.4.3 Minimum conformance requirements

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30 * F_{SFN} + 20 + 10 * F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30 * F_{SFN} + 180 + 10 * F_{max} \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.4.

5.2.4.4 Test description

5.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.4.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.4.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRA TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-93	E-UTRA event B2 threshold
Thresh2		dBm	-80	UTRA event B2 threshold
T1		s	5	
T2		s	≤10	
T3		s	1	

5.2.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.4.5-1 and 5.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.4.5-1 and 5.2.4.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.4.5-1 and 5.2.4.5-2. T3 starts.

9. If the UE transmits the UL to Cell 2 less than 120 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set Cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.4.4.3-1: Common Exception messages for E-UTRA TDD to UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.4.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	47 (-93 dBm)	-93 dBm EUTRA-Thres is actual threshold value in dBm (47 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2 UTRA CHOICE {			
utra-RSCP	35 (-80 dB)	-80 dB is actual UTRA-Thres is actual RSCP value in dB (35 - 115 dBm)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.4.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	This is the typical value range used in UTRAN TDD tests.	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

Table 5.2.4.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	**Value/remark**	**Comment**	**Condition**
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not Present		
Downlink information common for all radio links			

Information Element	Value/remark	Comment	Condition
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.4.5 Test requirement

Tables 5.2.4.4.1-1, 5.2.4.5-1 and 5.2.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD handover test.

Table 5.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to UTRA TDD handover test case (Cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	15.10	-3	-3
$\hat{E}_s / N_{oc}$	dB	15.10	-3	-3
N_{oc}	dBm/15kHz	-99.05		
RSRP	dBm/15kHz	-83,95	-102.05	-102.05
SCH_RP	dBm/15 kHz	-83.95	-102.05	-102.05
Io Note 2	dBm/9MHz	-56.04	-69.50	-69.50
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.4.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number Note 1		2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or}/I_{oc}$	dB	-3	12.6	12.6	-3	12.6	12.6
I_{oc}	dBm/1.28 MHz	-80.8					
PCCPCH RSCP	dBm	-86.8	-71.2	-71.2	n.a.		
Io Note 2	dBm/1.28 MHz	-79.04	-67.97	-67.97	-79.04	-67.97	-67.97
Propagation Condition		AWGN					
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: PCCPCH_RSCP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$

$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max}$ ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2.

The handover delay $D_{handover}$ shall be less than a total of 120 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5 E-UTRAN FDD - UTRAN TDD handover

5.2.5.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN FDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.5.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.5.3 Minimum conformance requirements

5.2.5.3.1 void

5.2.5.3.2 1.28Mcps TDD option

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1} = T_{offset} + T_{UL} + 30 * F_{SFN} + 20 + 10 * F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2} = T_{offset} + T_{UL} + 30 * F_{SFN} + 180 + 10 * F_{max} \text{ ms}$$

Where:

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
F_{max}	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.5.

5.2.5.3.2 void

5.2.5.4 Test description

5.2.5.4.1 void

5.2.5.4.2 1.28Mcps TDD option

5.2.5.4.2.1Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.2.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.2.5.4.3.

5. There is one E-UTRA FDD serving cell and one UTRATDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.5.4.2.1-1: General Test Parameters for E-UTRAN FDD - UTRAN TDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRA FDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN FDD measurement quantity			RSRP	
UTRAN TDD measurement quantity			P-CCPCH RSCP	
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-93	Absolute E-UTRAN RSRP threshold for event B2
Thresh2		dBm	-80	Absolute UTRAN P-CCPCH RSCP threshold for event B2
T1		s	5	
T2		s	≤ 10	
T3		s	1	

5.2.5.4.2.2 Test procedure

The test scenario comprises of two cells, E-UTRA TDD cell1 and UTRA TDD cell2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #1 as specified in TS 36.133 [4] Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.5.5.2-1 and 5.2.5.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.5.5.2.-1 and 5.2.5.5.2-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.5.5-1 and 5.2.5.5-2.
9. If the UE transmits the UL DPCH Cell 2 less than 120 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.5.4.2.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.5.4.2.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.5.4.2.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	47 (-93 dBm)	-93 dBm EUTRA-Thres is actual threshold value in dBm (46 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2UTRA CHOICE {			
utra-RSCP	35 (-80 dBm)	-80 dBm is actual UTRA-Thres is actual RSCP value in dBm (36-115dBm)	
}			
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.5.4.2.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.5.4.2.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

Table 5.2.5.4.2.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not present		
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.5.4.3 7.68 Mcps TDD option

Editor's note: FFS

5.2.5.5 Test requirement

5.2.5.5.1 3.84Mcps TDD option

Editor's note: FFS

5.2.5.5.2 1.28Mcps TDD option

Tables 5.2.5.4.2.1-1, 5.2.5.5.2-1 and 5.2.5.5.2-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD handover test.

Table 5.2.5.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 1]	dB			
OCNG_RB[Note 1]	dB			
$\hat{E}_s / N_{oc}$	dB	11 + TT	-3 + TT	-3+ TT
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s / I_{ot}$	dB	11 + TT	-3 + TT	-3+ TT
RSRP	dBm/15 KHz	-87 + TT	-101 + TT	-101+ TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.5.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*		Channel 2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or} / I_{oc}$	dB	-3 TT	11 TT	11 TT	-3 TT	11 TT	11 TT
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86 TT	-72 TT	-72 TT	n.a.		
Propagation Condition		AWGN					
* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt1}$= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max} ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 120 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5.5.2 7.68 Mcps TDD option

Editor's note: FFS

5.2.6 E-UTRA TDD - GSM handover

5.2.6.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, 15 and 23.

5.2.6.3 Minimum conformance requirements

The handover delay $T_{Handover}$ delay shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.6.3-1 and interruption time given in table 5.2.6.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.6.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.6.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.2 and shown in table 5.2.6.3-2:

Table 5.2.6.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.6.

5.2.6.4 Test description

5.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.6.4.3.
5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.6.4.1-1: General Test Parameters for E-UTRAN TDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1			Normal	
Inter-RAT measurement quantity			GSM Carrier RSSI	
E-UTRA RF Channel Number			1	E-UTRA RF Channel Number
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	E-UTRA Channel Bandwidth ($BW_{channel}$)
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		s	20	
T2		s	7	
T3		s	1	

5.2.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.6.5-1 and 5.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.6.5-1 and 5.2.6.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.6.5-2. T3 starts.
9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.6.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-6 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.6.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.6.4.3-3: ReportConfigInterRAT-B1-GERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-Threshold-GERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.6.4.3-4: MeasResults: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.6.4.3-5: MeasResultListGERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
CarrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC) and is used %%	
}			
Cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
Rssi		Set according to specific test	
}			
}			

5.2.6.5 Test requirement

Tables 5.2.6.4.1-1, 5.2.6.5-1 and 5.2.6.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case.

Table 5.2.6.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1, T2	T3
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s / N_{oc}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)	
$\hat{E}_s / I_{ot}$	dB	4	
RSRP Note 3	dBm/15kHz	-94	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.6.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{Handover\ delay}$ test requirement in this case is expressed as:

Handover delay $T_{Handover\ delay}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.6.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.3 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell

5.2.7.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.7.3 Minimum conformance requirements

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one in-sync is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.7.

5.2.7.4 Test description

5.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.2.7.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.2.7.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.7.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	≤5	
T2		s	1	

5.2.7.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.7.5-1 and 5.2.7.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Tables 5.2.7.5-1 and 5.2.7.5-2. T2 starts.
5. If the UE transmits the UL DPCCH to Cell 2 less than 290 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.7.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-1 Table H.3.3-3

Table 5.2.7.4.3-2: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.7.5 Test requirement

Tables 5.2.7.4.1-1, 5.2.7.5-1 and 5.2.7.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test.

Table 5.2.7.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 1 (E-UTRA)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	0	0
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	0	0
RSRP Note 3	dBm/15 KHz	-98	-98
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.7.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DCH_Ec/Ior	dB	Note 1	
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or} / I_{oc}$	dB	-infinity	-1.8
I_{oc}	dBm/3,84 MHz	-70	-70
CPICH_Ec/Io	dB	-infinity	-14
Propagation Condition	AWGN		

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt2}$ (note: the target cell is unknown)

$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover to an unknown target cell delay shall be less than a total of 290 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 240 ms for $T_{interrupt2}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.8 E-UTRAN FDD - GSM handover: unknown target cell

5.2.8.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, and 23.

5.2.8.3 Minimum conformance requirements

The handover delay $T_{Handover\ delay}$ shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.8.3-1 and interruption time given in table 5.2.8.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.8.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-2.

Table 5.2.8.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.8.

5.2.8.4 Test description

5.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.8.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.8.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
T1		s	≤7	
T2		s	1	

5.2.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.8.5-1 and 5.2.8.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.8.5-1 and 5.2.8.5-2. T2 starts.
5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.8.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-2 Table H.3.3-3

Table 5.2.8.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

5.2.8.5 Test requirement

Tables 5.2.8.4.1-1, 5.2.8.5-1 and 5.2.8.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover: unknown target cell test.

Table 5.2.8.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s / I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	
RSRP Note 3	dBm/15 kHz	-94	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.8.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover to an unknown target cell delay shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.9 E-UTRAN TDD - GSM handover: unknown target cell

5.2.9.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to GSM in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, and 23.

5.2.9.3 Minimum conformance requirements

The handover delay given in table 5.2.9.3-1 and interruption time given in table 5.2.9.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.9.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.9.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.2 and shown in table 5.2.9.3-2.

Table 5.2.9.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.9.

5.2.9.4 Test description

5.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.2.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.9.4.3.
5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.9.4.1-1: General Test Parameters for E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211 [8]
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211 [8]
T1		s	7	
T2		s	1	

5.2.9.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.9.5-1 and 5.2.9.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.9.5-1 and 5.2.9.5-2. T2 starts.
5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.9.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-2 Table H.3.3-3

Table 5.2.9.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

5.2.9.5 Test requirement

Tables 5.2.9.4.1-1, 5.2.9.5-1 and 5.2.9.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case when the target cell is unknown.

Table 5.2.9.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD GSM handover: unknown target cell test

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s / I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	

RSRP Note 3	dBm/15 kHz	-94
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.9.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN TDD – GSM handover: unknown target cell test

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{Handover\ delay}$ test requirement in this case is expressed as:

Handover delay $T_{Handover\ delay}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.9.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.10 E-UTRAN TDD - UTRAN TDD handover: unknown target cell

5.2.10.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.10.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.10.3 Minimum conformance requirements

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30 * F_{SFN} + 20 + 10 * F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30 * F_{SFN} + 180 + 10 * F_{max} \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.10.

5.2.10.4 Test description

5.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.2.10.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.2.10.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.10.4.1-1: General test parameters for E-UTRA TDD to unknown UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final conditions	Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of cell 1			Normal	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		s	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2		s	1	

5.2.10.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, a RRC message implying handover to UTRA 1.28Mcps TDD cell shall be sent to the UE including activation time "now". The end of the last TTI containing handover message is the beginning of T2 duration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 5.2.10.5-1 and 5.2.10.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Tables 5.2.10.5-1 and 5.2.10.5-2. T2 starts.

5. If the UE transmits the UL to Cell 2 less than 280ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

7. The SS shall set Cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.10.4.3-1: Common Exception messages for E-UTRA TDD to unknown UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-1 Table H.3.3-3

Table 5.2.10.4.3-2: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not Present		
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.10.5 Test requirement

Tables 5.2.10.4.1-1, 5.2.10.5-1 and 5.2.10.5-2 define the primary level settings including test tolerances for E-UTRAN TDD to unknown UTRAN TDD cell handover test.

Table 5.2.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case (cell1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BWchannel	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA (Note 1)	dB		
OCNG_RB (Note 1)	dB		
$\hat{E}_s / I_{ot}$	dB	3	3
$\hat{E}_s / N_{oc}$	dB	3	3
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-95	-95
SCH_RP	dBm/15 kHz	-95	-95
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.10.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 2			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or} / I_{oc}$	dB	-infinity	13	-infinity	13
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-infinity	-70	n.a.	
Propagation Condition		AWGN			

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt2}$

$T_{interrupt2}$= T_{offset}+T_{UL}+30*F_{SFN}+180 +10*F_{max} ms

T_{offset} = 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2.

The handover delay $D_{handover}$ shall be less than a total of 280 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.11 E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth

5.2.11.1 Test purpose

Same test purpose as in clause 5.2.1.1.

5.2.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD and only bands within band group FDD_N. Applicability requires support for FGI bits 8, and 22.

5.2.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.2.1.3 with the following exceptions:

- Instead of A.5.2.1 → use A.5.2.11.

5.2.11.4 Test description

5.2.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.11.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.11.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRA Channel Bandwidth (BWchannel)	MHz	5	
Note 1: See Table 5.2.1.4.1-1 for other general test parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

5.2.11.4.2 Test procedure

Same test procedure as in clause 5.2.1.4.2 with the following exceptions:

- Instead of Table 5.2.1.5-1 → use Table 5.2.11.5-1.

5.2.11.4.3 Message contents

Same message contents as in clause 5.2.1.4.3.

5.2.11.5 Test requirement

Same test requirement as in clause 5.2.1.5 with the following exceptions:

Tables 5.2.11.4.1-1, 5.2.11.5-1 and 5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover test.

Table 5.2.11.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD to UTRAN FDD handover test case (Cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 **FDD**
Io Note 2	dBm/4.5 MHz	-70.73	-70.73	-70.73
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 5.2.1.5-1 for other cell specific test parameters.				

5.3 Handover from E-UTRAN to non-3GPP RATs

5.3.1 E-UTRAN FDD - HRPD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined: Protocol procedure for the test state is under discussion.

- The Test system uncertainties applicable above 3GHz are undefined
- The Test Tolerances and Test Requirements applicable above 3GHz are undefined

5.3.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.1.

5.3.1.4 Test description

5.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.3.1.4.3.

5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.1.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (HRPD) measurement quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause [7.2A.4]. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.1.5-1 and 5.3.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.1.5-1 and 5.3.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.

8. The UE transmit tunnelled HRPD *Connection Request* and *Route Update* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.

9. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2. The tunnelled HRPD *Traffic Channel Assignment, HRPD Silence Parameters* and *HRPD Open Loop Parameters* messages are contained in *MobilityFromEUTRACommand.*

10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.1.5-1 and 5.3.1.5-2.

11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3B according to TS 36.508 [7] clause 4.5.3B. Cell 1 is the active cell.

13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions.

Table 5.3.1.4.3-1: Common Exception messages for E-UTRAN FDD - HRPD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-8 Table H.3.3-3 Table H.3.3-4

Table 5.3.1.4.2-2: MeasObjectCDMA2000: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	TypeHRPD		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.1.4.3-3: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	14 (-7 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.1.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.1.4.3-5: *MeasResultListCDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotPnPhase		Set according to specific test	
pilotStrength		Set according to specific test	
}			
}			

Table 5.3.1.4.3-6: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Rand	Not present		
mobilityParameters	Not present		
}			
}			
}			
}			

Table 5.3.1.4.3-7: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Meid	Not present		
dedicatedInfo	Set according to Table 8.4.5.4.3.3-7	HRPD Connection Request and Route Update	
}			
}			
}			
}			

Table 5.3.1.4.3-8: *HRPD Connection Request*

Information Element	**Value/remark**	**Comment**	**Condition**
SAPState	'0'B	SAP Header	

SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'0000001'	Connection Request	
TransactionID	Any allowed value	8 bit field	
RequestReason	'0000'	Access Terminal Initiated	

Table 5.3.1.4.3-9: *HRPD Route Update*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'0000000'B	Route Update	
MessageSequence	8 bits, Set by UE		
ReferencePilotPN	9 bits, Set by UE		
ReferencePilotStrength	6 bits, Set by UE		
ReferenceKeep	'1'B		
NumPilots	'0000'B		
CompatibleReserved	'0'B		
ReferencePilotChannelIncluded	'1'B		
ReferencePilotChannel	24 bits, Set by UE		
ReferencePilotArrivalIncluded	'1'B		
ReferencePilotArrival	15 bits, Set by UE		
Reserved	0-7 bits, Set all 0s by UE		

Table 5.3.1.4.3-10: *HRPD Traffic Channel Assignment*

Information Element	Value/remark	Comment	Condition
SAPState	'1'B	SAP Header	
SessionConfigurationToken	'0'B		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000001'B	Traffic Channel Assignment	
MessageSequence	Set by SS	8 bit field	
ChannelIncluded	'1'B	Channel record included	
Channel	'00000000000000000111010'B	channel record for Cell 15	
FrameOffset	'1010'B	frame offset for Cell 15	
DRCLength	'01'B	DRCLength for Cell 15	
DRCChannelGainBase	'111101'B	ratio of the power level of the DRC Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
ACKChannelGain	'000110'B	ratio of the power level of the Ack Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
NumPilots	'1'B		
PilotPN	'000110010'B	PN Offset of target sector (Cell 15)	
SofterHandoff	'0'B	Set to '0'since only 1 pilot included in message	
MACIndexLSBs	Set by SS	6 least significant bits of the MACIndex assigned to UE	
DRCCover	'001'B	index of the DRC cover associated with target sector (Cell 15)	
RABLength	'01'B	2 bit field	
RABOffset	'010'B	3 bit field	

Table 5.3.1.4.3-11: *HRPD Silence Parameters*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000010'B		
ReverseLinkSilenceDuration	2 bits, Set by SS		
ReverseLinkSilencePeriod	2 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

Table 5.3.1.4.3-12: *HRPD Open Loop Parameters*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000111'B		
NumPilots	'0001'B		
PilotPN	9 bits, Set by SS		
OpenLoopAdjust	8 bits, Set by SS		
InitialAdjust	5 bits, Set by SS		
PilotStrengthIncluded	1 bit, Set by SS		
PilotStrengthNominal	3 bits, Set by SS		
PilotStrengthCorrectionMin	3 bits, Set by SS		
PilotStrengthCorrectionMax	3 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

5.3.1.5 Test requirement

Tables 5.3.1.4.1-1, 5.3.1.5-1 and 5.3.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover test.

Table 5.3.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			

N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98.80	-98.80	-98.80
$\hat{E}_s / N_{oc}$	dB	-0.8	-0.8	-0.8
$\hat{E}_s / I_{ot}$	dB	-0.8	-0.8	-0.8
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.				
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.1.5-2: Cell Specific Test requirement Parameters for Cell 2 HRPD cell

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	T3
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21		
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18		
$\hat{I}_{or} / I_{oc}$	dB	-infinity	0	0
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips (60) indicated by the search window for known target HRPD cells in the message

KC = 1; 1 known cell; HRPD cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target HRPD cells (0).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.2 E-UTRAN FDD - cdma2000 1xRTT handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Mobility From EUTRA Command message parameters are undefined

InterRAT-Target and InterRAT-Message field description is FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11, and 24.

5.3.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.2.

5.3.2.4 Test description

5.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.3.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.2.4.3.
5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.2.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (cdma2000 1X) measurement quantity			CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.2.5-1 and 5.3.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.2.5-1 and 5.3.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.2.5-1 and 5.3.2.5-2.

9. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

12. Repeat steps 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.2.5 Test requirement

Tables 5.3.2.4.1-1, 5.3.2.5-1 and 5.3.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover test.

Table 5.3.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98 + TT	-98 + TT	-98 + TT
$\hat{E}_s / N_{oc}$	dB	0 + TT	0 + TT	0 +TT
$\hat{E}_s / I_{ot}$	dB	0 + TT	0 + TT	0 + TT
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.2.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	T3
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16		
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12		
$\hat{I}_{or} / I_{oc}$	dB	-infinity	0 + TT	0 + TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT	-10 + TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips (60) indicated by the search window for known target cdma2000 1xRTT cells in the message

KC = 1; 1 known cell; cdma2000 1xRTT cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target cdma2000 1xRTT cells (0).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.3 E-UTRAN FDD - HRPD handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The MobilityFromEUTRACommand message parameters are undefined

targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

NOTE: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.3.

5.3.3.4 Test description

5.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.3.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.3.4.3.
5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.3.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause [7.2A.4]. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.3.5-1 and 5.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table's 5.3.3.5-1 and 5.3.3.5-2.
7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.3.5 Test requirement

Tables 5.3.3.4.1-1, 5.3.3.5-1 and 5.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover: unknown target cell test.

Table 5.3.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s / N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s / I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.3.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_O = 1$; $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips (60) indicated by the search window for unknown target HRPD cells in the message

KC = 0; KC is the number of known target HRPD cells (0).

OC = 1; OC is the number of unknown target HRPD cells (1).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.4 E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Mobility From EUTRA Command message parameters are undefined

targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11, and 24.

5.3.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.4.

5.3.4.4 Test description

5.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.4.4.3.

5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.4.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.4.5-1 and 5.3.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table's 5.3.4.5-1 and 5.3.4.5-2.

7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.4.5 Test requirement

Tables 5.3.4.4.1-1, 5.3.4.5-1 and 5.3.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell test.

Table 5.3.4.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s / N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s / I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.4.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 2 (cdma2000 1X)	
		T1	T2
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_O = 1$; $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips (60) indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC = 0; KC is the number of known target cdma2000 1xRTT cells (0).

OC = 1; OC is the number of unknown target cdma2000 1xRTT cells (1).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.5 E-UTRAN TDD - HRPD handover

Editor's note: This Test case is incomplete for frequencies above 3GHz

- The Test system uncertainties applicable above 3GHz are undefined
- The Test Tolerances and Test Requirements applicable above 3GHz are undefined

5.3.5.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.5.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.5.

5.3.5.4 Test description

5.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 5.3.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.3.5.4.3.

5. There is one E-UTRA TDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.5.4.1-1: General test parameters for E-UTRAN TDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (HRPD) measurement quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.5.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause 7.2A.4. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.5.4.4-1 and 5.3.5.4.4-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.5.4.4-1 and 5.3.5.4.4-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B2.

7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.

8. The UE transmits tunnelled HRPD *Connection Request* and *Route Update* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.

9. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2. The tunnelled HRPD *Traffic Channel Assignment, HRPD Silence Parameters* and *HRPD Open Loop Parameters* messages are contained in *MobilityFromEUTRACommand.*

10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.5.4.4-1 and 5.3.5.4.4-2.

11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3B-RF according to TS 36.508 [7] clause 7.2A.4. Cell 1 is the active cell.

13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions.

Table 5.3.5.4.3-1: Common Exception messages for E-UTRAN TDD - HRPD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-8

Table 5.3.5.4.3-2: MeasObjectCDMA2000: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	TypeHRPD		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.5.4.3-3: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	14 (-7 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.5.4.3-4: *MeasuredResults*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.5.4.3-5: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE {			
preRegistrationStatusHRPD	TRUE		
measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotStrength		Set according to specific test	
}			
}			
}			

Table 5.3.5.4.3-6: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Rand	Not present		
mobilityParameters	Not present		
}			
}			
}			
}			

Table 5.3.5.4.3-7: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Meid	Not present		
dedicatedInfo	Set according to Table 5.3.5.4.3-8	HRPD Connection Request and Route Update	
}			
}			
}			
}			

Table 5.3.5.4.3-8: *dedicatedInfo* in *ULHandoverPreparationTransfer* (Table 5.3.5.4.3-7)

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
Length	Length of *HRPD Route Update* message (Table 5.3.5.4.3-10) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the UE	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00001110'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update.	
SessionLayerPacket	*HRPD Route Update* message (Table 5.3.5.4.3-10)		
Length	Length of *HRPD Connection Request* message (Table 5.3.5.4.3-9) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the UE	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00001100'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Idle State.	
SessionLayerPacket	*HRPD Connection Request* message (Table 5.3.5.4.3-9)		

Table 5.3.5.4.3-9: *HRPD Connection Request* (Table 5.3.5.4.3-8)

Information Element	Value/remark	Comment	Condition
MessageID	'0000001'	Connection Request	
TransactionID	Any allowed value	8 bit field	
RequestReason	'0000'	Access Terminal Initiated	

Table 5.3.5.4.3-10: *HRPD Route Update* (Table 5.3.5.4.3-8)

Information Element	Value/remark	Comment	Condition
MessageID	'0000000'B	Route Update	
MessageSequence	8 bits, Set by UE		
ReferencePilotPN	9 bits, Set by UE		
ReferencePilotStrength	6 bits, Set by UE		
ReferenceKeep	'1'B		
NumPilots	'0000'B		
CompatibleReserved	'0'B		
ReferencePilotChannelIncluded	'1'B		
ReferencePilotChannel	24 bits, Set by UE		
ReferencePilotArrivalIncluded	'1'B		
ReferencePilotArrival	15 bits, Set by UE		
Reserved	0-7 bits, Set all 0s by UE		

Table 5.3.5.4.3-11: *MobilityFromEUTRACommand* (step 9)

Derivation Path: 36.508, Table 4.6.1-6			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
mobilityFromEUTRACommand-r8 SEQUENCE {			
cs-FallbackIndicator	False		
purpose CHOICE{			
handover SEQUENCE {			
targetRAT-Type	cdma2000-HRPD		
targetRAT-MessageContainer	Set according to Table 5.3.5.4.3-12	HRPD Silence Parameters and HRPD Open Loop Parameters, HRPD Traffic Channel Assignment	
}			
}			
}			
}			
}			
}			

Table 5.3.5.4.3-12: *targetRAT-MessageContainer* in *MobilityFromEUTRACommand* (Table 5.3.5.4.3-11)

Information Element	Value/remark	Comment	Condition
SAPState	'1'B	SAP Header	
SessionConfigurationToken	'0'B		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
Length	Length of *HRPD Silence Parameters* message (Table 5.3.5.4.3-14) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header (Note 1)	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00001111'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Overhead Messages.	
SessionLayerPacket	*HRPD Silence Parameters* message (Table 5.3.5.4.3-14)	(Note 1)	
Length	Length of *HRPD Open Loop Parameters* message (Table 5.3.5.4.3-15) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header (Note 1)	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00000100'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Reverse Traffic Channel MAC.	
SessionLayerPacket	*HRPD Open Loop Parameters* message (Table 5.3.5.4.3-15)	(Note 1)	
Length	Length of *HRPD Traffic Channel Assignment* message (Table 5.3.5.4.3-13) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	

StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00001110'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update.	
SessionLayerPacket	*HRPD Traffic Channel Assignment* message (Table 5.3.5.4.3-13)		

NOTE 1: *HRPD Silence Parameters* message and *HRPD Open Loop Parameters* message can be sent in any order.

Table 5.3.5.4.3-13: *HRPD Traffic Channel Assignment* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	'00000001'B	Traffic Channel Assignment	
MessageSequence	Set by SS	8 bit field	
ChannelIncluded	'1'B	Channel record included	
Channel	'00000000000000000011 11010'B	channel record for Cell 15	
FrameOffset	'1010'B	frame offset for Cell 15	
DRCLength	'01'B	DRCLength for Cell 15	
DRCChannelGainBase	'111101'B	ratio of the power level of the DRC Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
ACKChannelGain	'000110'B	ratio of the power level of the Ack Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
NumPilots	'1'B		
PilotPN	'000110010'B	PN Offset of target sector (Cell 15)	
SofterHandoff	'0'B	Set to '0'since only 1 pilot included in message	
MACIndexLSBs	Set by SS	6 least significant bits of the MACIndex assigned to UE	
DRCCover	'001'B	index of the DRC cover associated with target sector (Cell 15)	
RABLength	'01'B	2 bit field	
RABOffset	'010'B	3 bit field	

Table 5.3.5.4.3-14: *HRPD Silence Parameters* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	'00000010'B		
ReverseLinkSilenceDuration	2 bits, Set by SS		
ReverseLinkSilencePeriod	2 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

Table 5.3.5.4.3-15: *HRPD Open Loop Parameters* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	'00000111'B		
NumPilots	'0001'B		
PilotPN	9 bits, Set by SS		
OpenLoopAdjust	8 bits, Set by SS		
InitialAdjust	5 bits, Set by SS		
PilotStrengthIncluded	1 bit, Set by SS		
PilotStrengthNominal	3 bits, Set by SS		
PilotStrengthCorrectionMin	3 bits, Set by SS		
PilotStrengthCorrectionMax	3 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

5.3.5.5 Test requirement

Tables 5.3.5.4.1-1, 5.3.5.5-1 and 5.3.5.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD handover.

Table 5.3.5.5-1: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 KHz	-98.8	-98.8	-98.8
$\hat{E}_s / N_{oc}$	dB	-0.8	-0.8	-0.8
$\hat{E}_s / I_{ot}$	dB	-0.8	-0.8	-0.8
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.5.5-2: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	T3
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21		
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0	0
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips (60) indicated by the search window for known target HRPD cells in the message

KC = 1; 1 known cell; HRPD cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target HRPD cells (0).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.6 E-UTRAN TDD - cdma2000 1xRTT handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.6.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11 and 24.

5.3.6.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.6.

5.3.6.4 Test description

5.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 5.3.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.6.4.3.
5. There is one E-UTRA TDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.6.4.1-1: General test parameters for E-UTRAN TDD to cdma2000 1xRTT handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4]Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (cdma2000 1X) measurement quantity			CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One cdma2000 1X carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		S	5	
T2		S	≤10	
T3		S	1	

5.3.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 5.3.6.5-1 and 5.3.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 5.3.6.5-1 and 5.3.6.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B2.

7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.

8. The UE transmits tunnelled *1xRTT GCSNA Encapsulated Page Response* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.

9. The SS transmits a tunnelled *1xRTT GCSNA Encapsulated Handoff Direction* message contained in a *MobilityFromEUTRACommand* on Cell1 to order the UE to perform inter RAT to Cell 2.

10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.6.5-1 and 5.3.6.5-2.

11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions.

Table 5.3.6.4.3-1: Common Exception messages for E-UTRAN TDD - cdma2000 1xRTT handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 5.3.6.4.3-2: *MeasConfig* (Table 5.3.6.4.3-1)

Derivation Path: 36.508, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f17		
measObject[1]	MeasObjectCDMA2000-GENERIC		
measObjectId[2]	IdMeasObject-f1		
measObject[2]	MeasObjectEUTRA-GENERIC(f1)		
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-B2-CDMA2000		
reportConfig[1]	ReportConfigInterRAT-B2-CDMA2000(-90, -14)		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f17		
reportConfigId[1]	IdReportConfig-B2-CDMA2000		
}			
measGapConfig CHOICE {			
Setup SEQUENCE {			
gapOffset CHOICE {			
gp0	60		
}			
}			
}			
}			

Table 5.3.6.4.3-3: *MeasObjectCDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	type1XRTT		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.6.4.3-4: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	28 (-14 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.6.4.3-5: *MeasuredResults*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.6.4.3-6: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE {			
preRegistrationStatusHRPD	FALSE		
measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotStrength		Set according to specific test	
}			
}			
}			

Table 5.3.6.4.3-7: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	type1XRTT		
Rand	Set by SS	Random Challenge Data as broadcast on Cell 2	
mobilityParameters	Set according to 36.508 Table 4.5.2C.4-6	CDMA2000Parameters	
}			
}			
}			
}			

Table 5.3.6.4.3-8: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	type1XRTT		
Meid	UE's meid		
dedicatedInfo	Set according to Table 5.3.6.4.3-8	1xRTT GCSNA Encapsulated Page Response message	
}			
}			
}			
}			

Table 5.3.6.4.3-9: *1xRTT GCSNA Encapsulated Page Response* (Table 5.3.6.4.3-7)

Information Element	Value/remark	Comment	Condition
MessageID	'00000001'B	GCSNA1xCircuitService message	
GCSNAOption	'00000001'B		
AlternativeGCSNAOption_INCL	'0'B		
IWSIDIncl	'0'B		
AckRequired	'0'B		
StopDupDetect	'0'B		
MessageSequence	6 bits, Set by UE		
NumTLACEncapsulated1xL3PDU	'00'B		
Reserved	'0000'B		
1xLogicalChannel	'0'B		
1xProtocolRevision	'00000110'B		
MsgType	'00000101'B	Page Response message	
NumTLACHeaderRecords	'0001'B		
TLACHeaderRecordType	'0000'B		
TLACHeaderRecordLength	8 bits, Set by UE		
MSID_TYPE	3 bits, Set by UE	Should be matched with PREF_MSID_TYPE	
MSID_LEN	4 bits, Set by UE		
MSID	Variable, Set by UE		
Reserved	'0000000'B		
1xL3PDULength	16 bits, Set by UE		
MOB_TERM	'1'B		
SLOT_CYCLE_INDEX	'010'B		
MOB_P_REV	8 bits, Set by UE		
SCM	8 bits, Set by UE		
REQUEST_MODE	'001'B		
SERVICE_OPTION	16 bits, Set by UE		
PM	'0'B		
NAR_AN_CAP	'0'B		
ENCRYPTION_SUPPORTED	'0000'B		
NUM_ALT_SO	'000'B		
UZID_INCL	'0'B		
CH_IND	'0'B		
OTD_SUPPORTED	'0000'B		
QPCH_SUPPORTED	'0'B		
ENHANCED_RC	'0'B		
FOR_RC_PREF	'0000'B		
REV_RC_PREF	'0'B		
FCH_SUPPORTED	'0'B		
FCH Capability Type-specific fields	Variable		
DCCH_SUPPORTED	'1'B		
REV_FCH_GATING_REQ	'0'B		

Table 5.3.6.4.3-10: *MobilityFromEUTRACommand*

Derivation Path: 36.508, Table 4.6.1-6			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
mobilityFromEUTRACommand-r9 SEQUENCE {			
cs-FallbackIndicator	False		
purpose CHOICE{			
e-CSFB-r9 SEQUENCE {			
messageContCDMA2000-1XRTT-r9	Set according to Table 5.3.6.4.3-10	1xRTT GCSNA Encapsulated Handoff Direction message	
}			
}			
}			
}			
}			
}			

Table 5.3.6.4.3-11: *1xRTT GCSNA Encapsulated Handoff Direction* (Table5.3.6.4.3-9)

Information Element	Value/remark	Comment	Condition
MessageID	‘00000001’B		
GCSNAOption	‘00000001’B		
AlternativeGCSNAOption_INCL	‘0’B		
IWSIDIncl	‘0’B		
AckRequired	‘0’B		
StopDupDetect	‘0’B		
MessageSequence	Set by SS		
NumTLACEncapsulated1xL3PDU	‘00’B		
Reserved	‘0000’B		
1xLogicalChannel	‘1’B		
1xProtocolRevision	‘00000110’B		
MsgType	‘00100010’B	Universal Handoff Direction message	
NumTLACHeaderRecords	‘0000’B		
Reserved	‘000’B		
1xL3PDULength	16 bits, Set by SS		
USE_TIME	’0’B		
ACTION_TIME	’000000’B		
HDM_SEQ	2 bits, Set by SS		
PARMS_INCL	’1’B		
P_REV	‘00000110’B		
SERV_NEG_TYPE	’1’B		
SEARCH_INCLUDED	’1’B		
SRCH_WIN_A	’1000’B		
SRCH_WIN_N	’1001’B		
SRCH_WIN_R	’1011’B		
T_ADD	’010100’B		
T_DROP	’011110’B		
T_COMP	’1010’B		
T_TDROP	’0100’B		
SOFT_SLOPE	’000000’B		
ADD_INTERCEPT	’000000’B		
DROP_INTERCEPT	’000000’B		
EXTRA_PARMS	’1’B		
PACKET_ZONE_ID	’00000000’B		
FRAME_OFFSET	4 bits, Set by SS		
PRIVATE_LCM	’0’B		
RESET_L2	’1’B		
RESET_FPC	’1’B		
ENCRYPT_MODE	’00’B		
NOM_PWR_EXT	’0’B		
NOM_PWR	’0000’B		
RLGAIN_TRAFFIC_PILOT	’000000’B		
DEFAULT_RLAG	’1’B		
NUM_PREAMBLE	’000’B		
BAND_CLASS	5 bits, Set by SS		
CDMA_FREQ	11 bits, Set by SS		
RETURN_IF_HANDOFF_FAIL	’0’B		
PERIODIC_SEARCH	’0’B		
SCR_INCLUDED	’1’B		
NNSCR_INCLUDED	’1’B		
USE_PWR_CNTL_STEP	’0’B		
CLEAR_RETRY_DELAY	’0’B		
SCH_INCL	’1’B		
FPC_SUBCHAN_GAIN	’01010’B		
USE_PC_TIME	’0’B		
CH_IND	’101’B		
ACTIVE_SET_REC_LEN	8 bits, Set by SS		
NUM_PILOTS	’001’B		
SRCH_OFFSET_INCL	’1’B		
PILOT_PN	’000000000’B		
SRCH_OFFSET	’010’B		
ADD_PILOT_REC_INCL	’0’B		

PWR_COMB_IND	'0'B		
CODE_CHAN_FCH	11 bits, Set by SS		
QOF_MASK_ID_FCH	'00'B		
RESERVED	0-7 bits		
REV_FCH_GATING_MODE	'0'B		

5.3.6.5 Test requirement

Tables 5.3.6.4.1-1, 5.3.6.5-1 and 5.3.6.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - cdma2000 1xRTT handover test.

Table 5.3.6.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 KHz	-98+TT	-98+TT	-98+TT
$\hat{E}_s / N_{oc}$	dB	0+TT	0+TT	0+TT
$\hat{E}_s / I_{ot}$	dB	0+TT	0+TT	0+TT
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.6.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	T3
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16		
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12		
$\hat{I}_{or} / I_{oc}$	dB	-infinity	0+TT	0+TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10+TT	-10+TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips (60) indicated by the search window for known target cdma2000 1xRTT cells in the message

KC = 1; 1 known cell; cdma2000 1xRTT cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target cdma2000 1xRTT cells (0).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6 RRC Connection Mobility Control

When the UE is in RRC_CONNECTED, for which security has been activated, initiate the RRC re-establishment procedure in order to continue the RRC connection, the RRC re-establishment process takes place. In this process the UE initiates the procedure when one of the following conditions is met: upon re-entry of the service area after having detected radio link failure, upon handover failure or when lower layers detect problems as defined in TS 36.331 [5] clause 5.3.7.2. After selecting the best cell the UE send a 'RRC Connection Re-establishment Request message' to the System Simulator as defined in TS 36.331 [5] clause 5.3.7. The connection re-establishment succeeds only if the concerned cell is prepared i.e. has a valid UE context within the specified UE re-establishment delay period.

When the random access procedure is initiated by a PDCCH order or by the MAC sublayer itself, the random access process takes place. This process allows the PDCCH order or RRC optionally to indicate a random access preamble and PRACH resource as defined in TS 36.321 [11] clause 5.1. In this process from the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response as defined in TS 36.213 [8] clause 6.1. The random access procedure is used when establishing the L1 communication between the UE and E-UTRAN.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3. This applies only for Re-establishment tests (subclause 6.1).

6.1 RRC Re-establishment

6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment

6.1.1.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.1.1.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}esta}blish\_delay = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq * Tsearch + TSI + TPRACH$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.1.

6.1.1.4 Test description

6.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.1.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.1.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.1.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.1.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.1.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.1.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.1.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.1.5 Test requirement

Table 6.1.1.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.1.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$TUE\_re\text{-}establish\_delay = 50\ ms + Nfreq * Tsearch + TSI + TPRACH$$

$N_{freq} = 1$

$T_{search} = 100$ ms

$T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.1_2 E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis

6.1.1_2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection for UE category 1bis.

6.1.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

6.1.1_2.3 Minimum conformance requirements

Same as in Clause 6.1.1.3.

6.1.1_2.4 Test description

6.1.1_2.4.1 Initial conditions

Same as in Clause 6.1.1.4.1 with the following exceptions:

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.20.

6.1.1_2.4.2 Test procedure

Same as in Clause 6.1.1.4.2.

6.1.1_2.4.3 Message contents

Same as in Clause 6.1.1.4.3.

6.1.1_2.5 Test requirement

Same as in Clause 6.1.1.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.1.1.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment

6.1.2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

6.1.2.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.2.

6.1.2.4 Test description

6.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.2.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.2.4.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA FDD inter-frequency carrier list size			1	2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.2.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.2.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.2.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 3 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.2.4.3-1: Common Exception messages for E-UTRAN FDD Inter-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.2.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

6.1.2.5 Test requirement

Table 6.1.2.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment test case.

Table 6.1.2.5-1: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA FDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$TUE\_re\text{-}establish\_delay = 50\ ms + Nfreq * Tsearch + TSI + TPRACH$$

$N_{freq} = 2$

$T_{search} = 800$ ms

$T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

$T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.1.2_2 E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis

6.1.2_2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection for UE category 1bis.

6.1.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

6.1.2_2.3 Minimum conformance requirements

Same as in Clause 6.1.2.3.

6.1.2_2.4 Test description

6.1.2_2.4.1 Initial conditions

Same as in Clause 6.1.2.4.1 with the following exceptions:

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.1.2_2.4.2 Test procedure

Same as in Clause 6.1.2.4.2.

6.1.2_2.4.3 Message contents

Same as in Clause 6.1.2.4.3.

6.1.2_2.5 Test requirement

Same as in Clause 6.1.2.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.1.2.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment

6.1.3.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.1.3.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq * Tsearch + TSI + T_{PRACH}$$

T_{search} is the time required by the UE to search the target cell.

T_{search} is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} is the additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq} is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; $N_{freq} = 1$ if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.3.

6.1.3.4 Test description

6.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.1.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.3.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.3.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.3.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 within 1.5 s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.3.4.3-1: Common Exception messages for E-UTRAN intra frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.3.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.3.5 Test requirement

Table 6.1.3.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.3.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE\_re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$N_{freq} = 1$

$T_{search} = 100$ ms

$T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.3_2 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis

6.1.3_2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection for UE category 1bis.

6.1.3_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

6.1.3_2.3 Minimum conformance requirements

Same as in Clause 6.1.3.3.

6.1.3_2.4 Test description

6.1.3_2.4.1 Initial conditions

Same as in Clause 6.1.3.4.1 with the following exceptions:

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.20.

6.1.3_2.4.2 Test procedure

Same as in Clause 6.1.3.4.2.

6.1.3_2.4.3 Message contents

Same as in Clause 6.1.3.4.3.

6.1.3_2.5 Test requirement

Same as in Clause 6.1.3.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.1.3.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment

6.1.4.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

6.1.4.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq * Tsearch + TSI + T_{PRACH}$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.4.

6.1.4.4 Test description

6.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.4.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.4.4.1-1: General test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA TDD inter-frequency carrier list size			1	2 E-UTRA TDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.4.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts.
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts.
7. If the UE starts to send PRACH preambles to cell 2 within 3s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.4.4.3-1: Common Exception messages for E-UTRAN inter frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.4.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedDependentParameters	Not present		
}			

6.1.4.5 Test requirement

Table 6.1.4.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Inter-frequency RRC Re-establishment test case.

Table 6.1.4.5-1: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA TDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$

$N_{freq} = 2$

$T_{search} = 800$ ms

$T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

$T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.1.4_2 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis

6.1.4_2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection for UE category 1bis.

6.1.4_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

6.1.4_2.3 Minimum conformance requirements

Same as in Clause 6.1.4.3.

6.1.4_2.4 Test description

6.1.4_2.4.1 Initial conditions

Same as in Clause 6.1.4.4.1 with the following exceptions:

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.1.4_2.4.2 Test procedure

Same as in Clause 6.1.4.4.2.

6.1.4_2.4.3 Message contents

Same as in Clause 6.1.4.4.3.

6.1.4_2.5 Test requirement

Same as in Clause 6.1.4.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.1.4.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth

6.1.5.1 Test purpose

Same test purpose as clause 6.1.1.1.

6.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N.

6.1.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.1.3 with the following exceptions:

- Instead of A.6.1.1 → use A.6.1.5.

6.1.5.4 Test description

6.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20.
2. The parameter settings for the cells are set up according to Table 6.1.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.5.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.5.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 6.1.1.4.1-1 for the other parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

6.1.5.4.2 Test procedure

Same test procedure as in clause 6.1.1.4.2 with the following exceptions:

- Instead of Table 6.1.1.5-1 → use Table 6.1.5.5-1.

6.1.5.4.3 Message contents

Same message contents as defined in clause 6.1.1.4.3.

6.1.5.5 Test requirement

Same test requirement as in clause 6.1.1.5 with the following exceptions:

Table 6.1.5.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.5.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case for 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD	OP.16 FDD	OP.16 FDD	OP.15 FDD
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 6.1.1.5-1 for the other parameters.							

6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0

6.1.6.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.6.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0.

6.1.6.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}esta}blish\_delay = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq*Tsearch + TSI + TPRACH$$

T_{search} = It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.6.

6.1.6.4 Test description

6.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.6.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.6.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.6.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.6.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.6.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.6.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.6.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.6.5 Test requirement

Table 6.1.6.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.6.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0

6.1.7.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.7.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0.

6.1.7.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq*Tsearch + TSI + TPRACH$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.7.

6.1.7.4 Test description

6.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.7.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.7.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.2.3
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.7.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.7.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.7.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.7.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.7.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.7.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN FDD intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.7.5 Test requirement

Table 6.1.7.5-1 defines the primary level settings including test tolerances for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.7.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1(OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0

6.1.8.1 Test purpose

To verify that the category 0 UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.8.2 Test applicability

This test applies to all type of E-UTRA TDD UE release 12 and forward of UE category 0.

6.1.8.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target PCell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH to the target PCell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * Tsearch + T_{SI} + T_{PRACH}$$

- T_{search}: It is the time required by the UE to search the target PCell.

  T_{search} = It is 100 ms if the target PCell is known by the UE; the target PCell is known if it has been measured by the UE in the last 5 seconds.

  T_{search} = It is 800 ms if the target PCell is unknown by the UE; the target PCell is unknown if it has not been measured by the UE in the last 5 seconds.

  T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target PCell.

  T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

  N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target PCell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.8.

6.1.8.4 Test description

6.1.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 using only main UE Tx/Rx antenna.
2. The parameter settings for the cells are set up according to Table 6.1.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.8.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.8.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.8.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.8.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.8.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.8.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 within 1.5 s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.8.4.3-1: Common Exception messages for E-UTRAN intra frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.8.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.8.5 Test requirement

Table 6.1.8.5-1 and Table 6.1.8.4.1-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.8.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 100$ ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeA

6.1.9.1 Test purpose

To verify that the CE UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.9.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.1.9.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [5] is detected by the UE to the moment the UE has transmitted all repetitions of the PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement for a UE configured with CEModeA shall be less than:$T_{UE\text{-}re\text{-}establish\_delay}$ = 50 ms + N_{freq}*Tsearch + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

- T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 for a UE configured with CEModeA.

  In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

- T_{SI}: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA. $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

- T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

- N_{freq}: It is the total number of frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.9.

6.1.9.4 Test description

6.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40 (using only main UE Tx/Rx antenna and without fading).
2. The parameter settings for the cells are set up according to Table 6.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.9.4.1-1: General test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.9.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.9.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.9.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.9.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 6.1.9.4.3-1: Common Exception messages for E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.7.1-1

Table 6.1.9.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.9.5 Test requirement

Table 6.1.9.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.9.5-1: Cell specific test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel in clause A.8.1		R.21 FDD	R.21 FDD	-	-	-	R.21 FDD
MPDCCH Reference Channel in clause A.7.1		R.17 FDD			R.17 FDD		
OCNG Patterns in clause D.1		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 0$ ms

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, within the allowance of 1.5 s in the test case.

6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeA

6.1.10.1 Test purpose

To verify that the CE UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.10.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.1.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.9.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.10.

6.1.10.4 Test description

6.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40 (using only main UE Tx/Rx antenna and without fading).
2. The parameter settings for the cells are set up according to Table 6.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.10.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.10.4.2 Test procedure

Same test procedure as in clause 6.1.9.4.2 with the following exceptions:

- Instead of Table 6.1.9.5-1 → use Table 6.1.10.5-1.

6.1.10.4.3 Message contents

Message contents are same as in Clause 6.1.9.4.3.

6.1.10.5 Test requirement

Table 6.1.10.5-1 defines the primary level settings including test tolerances for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.10.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel in clause A.8.2		R.11 HD-FDD	R.11 HD-FDD	-	-	-	R.11 HD-FDD
MPDCCH Reference Channel in clause A.7.2		R.7 HD-FDD			R.7 HD-FDD		
OCNG Patterns in clause D.1		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50\ ms + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 0\ ms$

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, within the allowance of 1.5 s in the test case.

6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for CE UE in CEModeA

6.1.11.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.11.2 Test applicability

This test applies to all type of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.1.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.9.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.11.

6.1.11.4 Test description

6.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 (using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.11.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.11.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.11.4.2 Test procedure

Same test procedure as in clause 6.1.9.4.2 with the following exceptions:

- Instead of Table 6.1.9.5-1 → use Table 6.1.11.5-1.

6.1.11.4.3 Message contents

Message contents are same as in Clause 6.1.9.4.3.

6.1.11.5 Test requirement

Table 6.1.11.5-1 and Table 6.1.11.4.1-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.11.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for CE UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel in clause A.8.3		R.17 TDD	R.17 TDD	-	-	-	R.17 TDD
MPDCCH Reference Channel in clause A.7.3		R.15 TDD			R.15 TDD		
OCNG Patterns in clause D.2		OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.11 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 0$ ms

$T_{SI-EUTRA-M1-CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, allow 1.5 s in the test case.

6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeB

6.1.12.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB..

6.1.12.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq} * Tsearch + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$$

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 in TS 36.331 [5] for a UE configured with CEModeA or as described in Clause 8.13.3.1 in TS 36.331 [5] for a UE configured with CEModeB.

In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

$T_{SI-EUTRA-M1-CEModeB}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA; $T_{SI-EUTRA-M1-CEModeB}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

Nfreq: It is the total number of frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.12.

6.1.12.4 Test description

6.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40 (using only main UE Tx/Rx antenna and without fading).
2. The parameter settings for the cells are set up according to Table 6.1.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.12.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.12.4.1-1: General test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		s	5	
T3		ms	4000	
T4		s	9	

6.1.12.4.2 Test procedure

The test consists of 4 successive time periods, with time duration of T1, T2, T3 and T4 respectively. At the start of time period T3, cell 1, which is the active cell, is deactivated. The time period T4 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.12.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.12.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 7 s from the beginning of time period T4, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T4 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 6.1.12.4.3-1: Common Exception messages for E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeB

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.7.1-1

Table 6.1.12.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
quantityConfig	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.12.5 Test requirement

Table 6.1.12.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.12.5-1: Cell specific test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH Reference Channel in clause A.8.1		R.23 FDD	R.23 FDD	R.23 FDD	-	-	-	-	R.23 FDD
MPDCCH Reference Channel in clause A.7.1		R.19 FDD				R.19 FDD			
OCNG Patterns in clause D.1		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3				-3			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s / I_{ot}$	dB	1.54	-12.14	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s / N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-112.4	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN				AWGN			
Antenna Configuration		2x1				2x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T4, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50\ ms + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 0\ ms$

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for CE UE in CEModeB

6.1.13.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.13.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

6.1.13.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.12.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2 and A.6.1.13.

6.1.13.4 Test description

6.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40 (using only main UE Tx/Rx antenna and without fading).
2. The parameter settings for the cells are set up according to Table 6.1.13.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.13.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.13.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		s	5	
T3		ms	4000	
T4		s	9	

6.1.13.4.2 Test procedure

Same test procedure as in clause 6.1.12.4.2 with the following exceptions:

- Instead of Table 6.1.12.5-1 → use Table 6.1.13.5-1.

6.1.13.4.3 Message contents

Message contents are same as in Clause 6.1.12.4.3.

6.1.13.5 Test requirement

Table 6.1.13.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.13.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH Reference Channel in clause A.8.2		R.13 HD-FDD	R.13 HD-FDD	R.13 HD-FDD	-	-	-	-	R.13 HD-FDD
MPDCCH Reference Channel in clause A.7.2		R.9 HD-FDD				R.9 HD-FDD			
OCNG Patterns in clause D.1		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3				-3			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s / I_{ot}$	dB	1.54	-12.14	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s / N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-112.4	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN				AWGN			
Antenna Configuration		2x1				2x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50\ ms + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$

N_{freq} = 1

T_{search} = 0 ms

$T_{SI-EUTRA-M1-CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for CE UE in CEModeB

6.1.14.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB..

6.1.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.12.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2 and A.6.1.14.

6.1.14.4 Test description

6.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40 (using only main UE Tx/Rx antenna and without fading).
2. The parameter settings for the cells are set up according to Table 6.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.14.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.14.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells
T1		s	5	
T2		s	5	
T2		ms	4000	
T3		s	9	

6.1.14.4.2 Test procedure

Same test procedure as in clause 6.1.12.4.2 with the following exceptions:

- Instead of Table 6.1.12.5-1 → use Table 6.1.14.5-1.

6.1.14.4.3 Message contents

Message contents are same as in Clause 6.1.12.4.3.

6.1.14.5 Test requirement

Table 6.1.14.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.14.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for CE UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH Reference Channel in clause A.8.3		R.19 TDD	R.19 TDD	R.19 TDD	-	-	-	-	R.19 TDD
MPDCCH Reference Channel in clause A.7.3		R.17 TDD				R.17 TDD			
OCNG Patterns in clause D.2		OP.11 TDD	OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.11 TDD
PBCH_RA	dB	-3				-3			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s / I_{ot}$	dB	1.54	-12.14	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s / N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-112.4	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN				AWGN			
Antenna Configuration		2x1				2x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50\ ms + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$

$N_{freq} = 1$

$T_{search} = 0\ ms$

$T_{SI\ I\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.15 HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

6.1.15.1 Test purpose

The purpose is to verify that the NB-IoT HD-FDD intra-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.15.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for User Plane CIoT EPS optimization.

6.1.15.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay\_NB\text{-}IoT}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay\_NB\text{-}IoT}$) shall be less than:

$$T_{re\text{-}establish\_delay\_NB\text{-}IoT} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends NPRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB1\text{-}EC} + T_{SI\_NB1\text{-}EC} + T_{NPRACH\_NB\text{-}IoT}$$

$T_{search\_NB1\text{-}EC}$: It is the time required by the UE to search the target cell:

If the target cell is known, then $T_{search\_NB1\text{-}EC}$ = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search\_NB1\text{-}EC}$ = 80 ms. Otherwise, $T_{search\_NB1\text{-}EC}$ = 14800 ms.

$T_{SI\_NB1\text{-}EC}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell for a UE in enhanced coverage.

$T_{NPRACH\_NB\text{-}IoT}$: The additional delay caused by the random access procedure; the actual value of $T_{PRACH\_NB\text{-}IoT}$ shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure;

$N_{NB\text{-}Iot\text{-}freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB\text{-}Iot\text{-}freq}$ = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.15.

6.1.15.4 Test description

6.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table Annex E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2..

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 6.1.15.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.45, using only main Tx/Rx antenna.
2. The parameter settings for the cells are set up according to Table 6.1.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.15.4.3.
5. There is one NB-IoT carrier and one E-UTRA FDD carrier and four cells specified in the test. NCell1 is inband to Cell1 and NCell2 is inband to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell 1 and Ncell 2 are NB-IoT cells with different physical cell ID on the same frequency carrier.

Table 6.1.15.4.1-1: General test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		eCell1, eCell2, Ncell2	
Final condition	Active cell		Ncell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell1 and eCell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
NPRACH Configuration			1	Refer to Table A.10.3-1
NPDCCH repetition level			16	NPDCCH R_{max}
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311-v13xy		ms	60000	RRC re-establishment timer
DRX			OFF	
T1		s	5	
T2		ms	400	
T3		s	60	

6.1.15.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, Ncell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.15.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.15.5-1. T2 starts.
4. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.15.5-1. T3 starts.
5. If the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2 within 58s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Once the UE sends a prach in step 5, switch off the UE. Then ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.
7. Repeat step 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 6.1.15.4.3-1: *SystemInformationBlockType1-NB*

Derivation Path: 36.508 Table 8.1.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-NB ::= SEQUENCE {			
cellSelectionInfo-r13 SEQUENCE {			
q-QualMin-r13	-25 (-25dB)		
}			
}			

6.1.15.5 Test requirement

Table 6.1.15.5-1 and Table 6.1.15.5-2 defines the primary level settings including test tolerances for HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.15.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within Cell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30			eCell 2 $BW_{channel}$ 5MHz: 17 eCell 2 $BW_{channel}$ 10MHz: 30		
NPDSCH parameters defined in clause A.10.2		eCell 1 $BW_{channel}$ 5MHz: R.16 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.14 HD-FDD			eCell 2 $BW_{channel}$ 5MHz: R.16 HD-FDD eCell 2 $BW_{channel}$ 10MHz: R.14 HD-FDD		
NPDCCH parameters defined in clause A.10.1		eCell 1 $BW_{channel}$ 5MHz: R.38 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.26 HD-FDD			eCell 2 $BW_{channel}$ 5MHz: R.38 HD-FDD eCell 2 $BW_{channel}$ 10MHz: R.26 HD-FDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table 6.1.15.5-2					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	-Infinity	-12.6	-12.6
$\hat{E}_s / I_{ot}$ Note2	dB	7	-Infinity	-Infinity	-Infinity	-12.6	-12.6
NRSRP Note2	dBm/15 kHz	-91	-Infinity	-Infinity	-Infinity	-110.6	-110.6
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Ncell 1	ms	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.1.15.5-2: Cell 1 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	eCell 1			eCell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5 or 10			5 or 10		
NOCNG Patterns		$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD			$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
[PCFICH_RB]	dB						
[PDCCH_RA]	dB						
[PDCCH_RB]	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-98			-98		
$\hat{E}_s / N_{oc}$	dB	-12.6	-12.6	-12.6	-12.6	-12.6	-12.6
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to eCell 1	ms	-			3		

Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2.

The RRC re-establishment delay to a unknown NB-IoT FDD intra frequency cell shall be less than 58s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB\text{-}IoT} + T_{SI\_NB\text{-}IoT} + T_{NPRACH\_NB\text{-}IoT}$

$N_{NB\text{-}Iot\text{-}freq} = 1$

$T_{search\_NB\text{-}IoT} = 14800ms$

$T_{SI\_NB\text{-}IoT} = 41560ms$; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

$T_{NPRACH\_NB\text{-}IoT} = 1280ms$; it is the additional delay caused by the random access procedure.

6.1.16 HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

6.1.16.1 Test purpose

The purpose is to verify that the NB-IoT HD-FDD inter-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.16.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for user plane CIoT EPS optimization.

6.1.16.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay\_NB\text{-}IoT}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay\_NB\text{-}IoT}$) shall be less than:

$$T_{re\text{-}establish\_delay\_NB\text{-}IoT} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends NPRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB1\text{-}NC} + T_{SI\_NB1\text{-}NC} + T_{NPRACH\_NB\text{-}IoT}$$

$T_{search\_NB1\text{-}NC}$: It is the time required by the UE to search the target cell:

If the target cell is known, then $T_{search\_NB1\text{-}NC}$ = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search\_NB1\text{-}NC}$ = 80 ms. Otherwise, $T_{search\_NB1\text{-}NC}$ = 1400 ms.

$T_{SI\_NB1\text{-}NC}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell for a UE in normal coverage.

$T_{NPRACH\_NB\text{-}IoT}$: The additional delay caused by the random access procedure; the actual value of $T_{PRACH\_NB\text{-}IoT}$ shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure;

$N_{NB\text{-}Iot\text{-}freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB\text{-}Iot\text{-}freq}$ = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.16.

6.1.16.4 Test description

6.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 6.1.16.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.45, using only main Tx/Rx antenna.

2. The parameter settings for the cells are set up according to Table 6.1.16.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.1.16.4.3.

5. There are two NB-IoT carriers and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell1 and Ncell2 are NB-IoT cells on different frequency carriers.

Table 6.1.16.4.1-1: General test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
Final condition	Active cell		Ncell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
NPRACH Configuration			1	Refer to Table A.10.3-1
NPDCCH repetition level			16	NPDCCH R_{max}
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	15000	RRC re-establishment timer
DRX			OFF	
T1		s	5	
T2		ms	400	
T3		s	15	

6.1.16.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, Ncell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.16.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.16.5-1. T2 starts

4. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.16.5-1. T3 starts

5. If the UE starts to send NPRACH preambles to Ncell2 for sending the*RRCConnectionReestablishmentRequest-NB* message to Ncell 2 within 12s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. Once the UE sends a prach in step 5, cause UE handover back to Ncell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.

7. Repeat step 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6.

6.1.16.5 Test requirement

Table 6.1.16.5-1 and 6.1.16.5-2 defines the primary level settings including test tolerances for HD- FDD Inter-frequency RRC Re-establishment test case.

Table 6.1.16.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within Cell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30			eCell 1 $BW_{channel}$ 5MHz: 22 eCell 1 $BW_{channel}$ 10MHz: 35		
NPDSCH parameters defined in clause A.10.2		eCell 1 $BW_{channel}$ 5MHz: R.16 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.14 HD-FDD			eCell 1 $BW_{channel}$ 5MHz: R.16 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.14 HD-FDD		
NPDCCH parameters defined in clause A.10.1		eCell 1 $BW_{channel}$ 5MHz: R.38 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.26 HD-FDD			eCell 1 $BW_{channel}$ 5MHz: R.38 HD-FDD eCell 1 $BW_{channel}$ 10MHz: R.26 HD-FDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table 6.1.16.5-2					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	-Infinity	4	4
$\hat{E}_s / I_{ot}$ Note2	dB	7	-Infinity	-Infinity	-Infinity	4	4
NRSRP Note2	dBm/15 kHz	-91	-Infinity	-Infinity	-Infinity	-94	-94
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Ncell 1	ms	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.1.16.5-2: eCell 1 specific test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Cell 1		
		T1	T2	T3
$BW_{channel}$	MHz	5 or 10		
NOCNG Patterns		$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4	4	4
Propagation Condition		AWGN		
Antenna Configuration		1x1		
Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.				

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2.

The RRC re-establishment delay to a unknown NB-IoT FDD inter frequency cell shall be less than 12s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB\text{-}IoT} + T_{SI\_NB\text{-}IoT} + T_{NPRACH\_NB\text{-}IoT}$

$N_{NB\text{-}Iot\text{-}freq} = 2$

$T_{search\_NB\text{-}IoT} = 1400ms$

$T_{SI\_NB\text{-}IoT} = 8320ms$; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

$T_{NPRACH\_NB\text{-}IoT} = 80ms$; it is the additional delay caused by the random access procedure.

6.1.17

6.1.18 E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA

6.1.18.1 Test purpose

To verify that the CE UE in CEModeA is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.18.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL and non-BL CE UEs.

6.1.18.3 Minimum conformance requirements

Same minimum conformance requirements as in 6.1.9.3

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.and A.6.1.18.

6.1.18.4 Test description

6.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.14 using only main Tx/Rx antenna and without fading.
2. The general test parameter settings are set up according to Table 6.1.18.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 6.1.18.4.3.
5. There is one E-UTRA HD-FDD carrier and two cell on that carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.18.4.1-1: General test parameters for E-UTRAN HD-FDD inter frequency RRC Re-establishment for CE UE in CEModeA

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	

Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	Only one FDD carrier frequency is used.
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA FDD inter-frequency carrier list size			1	2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.3.16
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	400	
T3		s	3	

6.1.18.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.18.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.18.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.18.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 3.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 6.1.18.4.3-1: Common Exception messages for E-UTRAN FD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.7.1-1

Table 6.1.18.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency FD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.18.5 Test requirement

Tables 6.1.18.4.1-1 and 6.1.18.5-1 define the primary level settings including test tolerances.

Table 6.1.18.5-1: Cell specific test parameters for HD-FDD inter frequency RRC Re-establishment for CE UE in CEModeA

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
PDSCH parameters (As specified in clause A.3.1.4.2)		DL Reference Measurement Channel R.11 HD-FDD			DL Reference Measurement Channel R.11 HD-FDD		
MPDCCH parameters (As specified in clause A.3.1.3.2)		DL Reference Measurement Channel R.11 HD-FDD			DL Reference Measurement Channel R.11 HD-FDD		
OCNG Patterns defined in A.3.2.1.21 (OP.21 FDD) and in A.3.2.1.6 (OP.6 FDD)		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	-Infinity	-Infinity	-91
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 (Asynchronous cells)	Ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD inter frequency cell shall be less than 3.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90% with the confidence level of 95%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay} = 50\ ms + N_{freq} * T_{search} + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA} + T_{PRACH}$

$N_{freq} = 2$

$T_{search} = 1000\ ms$

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 3345 ms, allow 3.5 s in the test case.

6.1.23 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage

6.1.23.1 Test purpose

The purpose is to verify that the NB-IoT TDD inter-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.23.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher. Applicability requires support for user plane CIoT EPS optimization

6.1.23.3 Minimum conformance requirements

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB1\text{-}NC} + T_{SI\_NB1\text{-}NC} + T_{PRACH\_NB\text{-}IoT}$$

$T_{search\_NB1\text{-}NC}$: It is the time required by the UE to search the target cell:

If the target cell is known, then $T_{search\_NB1\text{-}NC}$ = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search\_NB1\text{-}NC}$ = 80 ms. Otherwise, $T_{search\_NB1\text{-}NC}$ = 1400 ms.

$T_{SI\_NB1\text{-}NC}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell for a UE in normal coverage.

$T_{PRACH\_NB\text{-}IoT}$: The additional delay caused by the random access procedure. The actual value of $T_{PRACH\_NB\text{-}IoT}$ shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure.

$N_{NB\text{-}Iot\text{-}freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB\text{-}Iot\text{-}freq}$ = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.23.

6.1.23.4 Test description

6.1.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 6.1.23.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.45, using only main Tx/Rx antenna.
2. The parameter settings for the cells are set up according to Table 6.1.23.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.16.4.3.
5. There are two NB-IoT carriers and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell1 and Ncell2 are NB-IoT cells on different frequency carriers.

Table 6.1.23.4.1-1: General test parameters for TDD Inter-frequency RRC Re-establishment for UE category NB1 UE in In-Band mode under normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		nCell1	
	Neighbour cells		eCell1, nCell2	
Final condition	Active cell		nCell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [16]
NPRACH Configuration			NPRACH.R-2	As specified in A.3.18
NPDCCH repetition level			16	The value shall be used for all cells in the test.
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	15000	RRC re-establishment timer
DRX			OFF	
T1		s	5	
T2		ms	400	
T3		s	15	

6.1.23.4.2 Test procedure

Same test procedure as in clause 6.1.16.4.2 with the following exceptions:

- Instead of Table 6.1.16.5-1 → use Table 6.1.23.5-1.

6.1.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6.

6.1.23.5 Test requirement

Table 6.1.23.5-1 and 6.1.23.5-2 defines the primary level settings including test tolerances for TDD Inter-frequency RRC Re-establishment test case.

Table 6.1.23.5-1: nCell 1, nCell 2 specific test parameters for TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage

Parameter	Unit	nCell 1			nCell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within eCell	-	eCell1 $BW_{channel}$ 10MHz: 30			eCell1 $BW_{channel}$ 10MHz: 35		
NPDSCH parameters		eCell1 $BW_{channel}$ 10MHz: R.14 NB-TDD			eCell1 $BW_{channel}$ 10MHz: R.14 NB-TDD		
NPDCCH parameters		eCell1 $BW_{channel}$ 10MHz: R.26 NB-TDD			eCell1 $BW_{channel}$ 10MHz: R.26 NB-TDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table A.6.1.23.1-3					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	-Infinity	4	4
$\hat{E}_s / I_{ot}$ Note2	dB	7	-Infinity	-Infinity	-Infinity	4	4
NRSRP Note2	dBm/15 kHz	-91+TT	-Infinity	-Infinity	-Infinity	-94	-94
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to nCell 1	µs	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.1.23.5-2: eCell 1 specific test parameters for TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage

Parameter	Unit	eCell 1		
		T1	T2	T3
$BW_{channel}$	MHz	10		
NOCNG Patterns		$BW_{channel}$ 10MHz: NOP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$	dB	4	4	4
$\hat{E}_s / I_{ot}$ Note2	dB	4	4	4
RSRP Note2	dBm/15 kHz	-94	-94	-94
Propagation Condition		AWGN		
Antenna Configuration		1x1		

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NB-IoT TDD inter frequency cell shall be less than 12 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

- T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.
- $T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB\text{-}IoT} + T_{SI\_NB\text{-}IoT} + T_{RACH\_NB\text{-}IoT}$
- $N_{NB\text{-}Iot\text{-}freq} = 2$
- $T_{search\_NB\text{-}IoT} = 1400\ ms$
- $T_{SI\_NB\text{-}IoT} = 8320\ ms$; it is the time required for receiving all the relevant system information as defined in TS 36.331 [2] for the target NB-IoT TDD cell.
- $T_{PRACH\_NB\text{-}IoT} = 80\ ms$; it is the additional delay caused by the random access procedure.

6.1.24 E-UTRAN TDD - TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage

6.1.24.1 Test purpose

The purpose is to verify that the NB-IoT TDD inter-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.24.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher. Applicability requires support for user plane CIoT EPS optimization

6.1.24.3 Minimum conformance requirements

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB1\text{-}EC} + T_{SI\_NB1\text{-}EC} + T_{PRACH\_NB\text{-}IoT}$$

- $T_{search\_NB1\text{-}EC}$: It is the time required by the UE to search the target cell:
  - If the target cell is known, then $T_{search\_NB1\text{-}EC} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search\_NB1\text{-}EC} = 80$ ms. Otherwise, $T_{search\_NB1\text{-}EC} = 14800$ ms.
- $T_{SI\_NB1\text{-}EC}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell for a UE in enhanced coverage.
- $T_{PRACH\_NB\text{-}IoT}$: The additional delay caused by the random access procedure. The actual value of $T_{PRACH\_NB\text{-}IoT}$ shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure.
- $N_{NB\text{-}Iot\text{-}freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB\text{-}Iot\text{-}freq} = 1$ if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.24.

6.1.24.4 Test description

6.1.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 6.1.24.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.45, using only main Tx/Rx antenna.
2. The parameter settings for the cells are set up according to Table 6.1.24.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.24.4.3.

5. There is one NB-IoT carrier and one E-UTRA TDD carrier and four cells specified in the test. NCell1 is inband to Cell1 and NCell2 is inband to Cell2. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell 1 and Ncell 2 are NB-IoT cells with different physical cell ID on the same frequency carrier.

Table 6.1.24.4.1-1: General test parameters for TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		nCell1	
	Neighbour cells		eCell1, eCell2, nCell2	
Final condition	Active cell		nCell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for eCell1 and eCell2.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [16]
NPRACH Configuration			NPRACH.R-2	As specified in A.3.18
NPDCCH repetition level			16	NPDCCH R_{max}
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		Ms	0	Radio link failure timer; T310 is disabled
T311-v13xy		Ms	60000	RRC re-establishment timer
DRX			OFF	
T1		S	5	
T2		Ms	400	
T3		S	60	

6.1.24.4.2 Test procedure

Same test procedure as in clause 6.1.15.4.2 with the following exceptions:

- Instead of Table 6.1.15.5-1 → use Table 6.1.24.5-1.

6.1.24.4.3 Message contents

Same message contents as in clause 6.1.15.4.3.

6.1.24.5 Test requirement

Table 6.1.24.5-1 and 6.1.24.5-2 defines the primary level settings including test tolerances for TDD Inter-frequency RRC Re-establishment test case.

Table 6.1.24.5-1: nCell 1, nCell 2 specific test parameters for TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage

Parameter	Unit	nCell 1			nCell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within eCell	-	eCell1 $BW_{channel}$ 10MHz: 30			eCell1 $BW_{channel}$ 10MHz: 30		
NPDSCH parameters		eCell1 $BW_{channel}$ 10MHz: R.14 NB-TDD			eCell1 $BW_{channel}$ 10MHz: R.14 NB-TDD		
NPDCCH parameters		eCell1 $BW_{channel}$ 10MHz: R.26 NB-TDD			eCell1 $BW_{channel}$ 10MHz: R.26 NB-TDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table A.6.1.24.1-3					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	-Infinity	-12.6	-12.6
$\hat{E}_s / I_{ot}$ Note2	dB	7	-Infinity	-Infinity	-Infinity	-12.6	-12.6
NRSRP Note2	dBm/15 kHz	-91	-Infinity	-Infinity	-Infinity	-110.6	-110.6
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to nCell 1	us	-			3		

Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.1.24.5-2: eCell 1 and eCell2 specific test parameters for TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage

Parameter	Unit	eCell 1			eCell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	10			10		
NOCNG Patterns		$BW_{channel}$ 10MHz: NOP.1 TDD			$BW_{channel}$ 10MHz: NOP.1 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PCFICH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Note2	dBm/15 kHz	-98			-98		
	dBm	-12.6	-12.6	-12.6	-12.6	-12.6	-12.6
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to eCell 1	us	-			3		

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NB-IoT TDD intra frequency cell shall be less than 60 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

- T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.
- $T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\ ms + N_{NB\text{-}Iot\text{-}freq} * T_{search\_NB\text{-}IoT} + T_{SI\_NB\text{-}IoT} + T_{PRACH\_NB\text{-}IoT}$
- $N_{NB\text{-}Iot\text{-}freq} = 1$
- $T_{search\_NB\text{-}IoT} = 14800\ ms$
- $T_{SI\_NB\text{-}IoT} = 41560\ ms$; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT TDD cell.
- $T_{PRACH\_NB\text{-}IoT} = 2560\ ms$; it is the additional delay caused by the random access procedure.

6.2 Random Access

6.2.1 E-UTRAN FDD - Contention Based Random Access Test

6.2.1.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.1.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.1.

6.2.1.4 Test description

6.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.1.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to Tables 6.2.1.5-1 and 6.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response reception

   4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

5. Test 2: Correct behaviour when not receiving random access response reception

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 10 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3.

   6.0. For BL UEs, continue to step 7. Test 3 is not applicable.

6.1. Repeat step 1-3.

6.2. In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

6.3. The UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The UE shall consider this random access response reception successful and transmit the msg3.

6.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.1.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.1.5 Test requirement

Tables 6.2.1.5-1 and 6.2.1.5-2 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.1.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.1/2 FDD Note 1	As defined in D.1.1/2.
PDSCH parameters Note 4		DL Reference Measurement Channel R.0 FDD Note 4	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.
Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.

Table 6.2.1.5-2: RACH-Configuration parameters for E-UTRAN FDD - Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element

and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.1.5-3: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Table 6.2.1.5-4: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.1.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.1_2 E-UTRAN FDD - Contention Based Random Access Test for UE Category 1bis

6.2.1_2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits for UE category 1bis.

6.2.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

6.2.1_2.3 Minimum conformance requirements

Same as in Clause 6.2.1.3.

6.2.1_2.4 Test description

6.2.1_2.4.1 Initial conditions

Same as in Clause 6.2.1.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

6.2.1_2.4.2 Test procedure

Same as in Clause 6.2.1.4.2.

6.2.1_2.4.3 Message contents

Same as in Clause 6.2.1.4.3.

6.2.1_2.5 Test requirement

Same as in Clause 6.2.1.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.2.1.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.2.2 E-UTRAN FDD - Non-Contention Based Random Access Test

6.2.2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.2.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.2.

6.2.2.4 Test description

6.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.2.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 6.2.2.5-1 and 6.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

4. Test 1: Correct behaviour when receiving Random Access Response

   4.1 In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

5. Test 2: Correct behaviour when not receiving Random Access Response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preamble.

   5.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The UE shall consider this random access response reception successful.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

6.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.2.4.3-1: Common Exception messages for E-UTRAN FDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.2.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.2.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

Table 6.2.2.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.2.5 Test requirement

Tables 6.2.2.5-1 and 6.2.2.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test. Table 6.2.2.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table 6.2.2.5-2: RACH-Configuration parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.2.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.

- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.2.5-3..
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Table 6.2.2.5-3: Absolute power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Table 6.2.2.5-4: Relative power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.2.5-5: Test requirements for Te Timing Error Limit for E-UTRAN FDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.2_2 E-UTRAN FDD - Non-Contention Based Random Access Test for UE Category 1bis

6.2.2_2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits for UE category 1bis.

6.2.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

6.2.2_2.3 Minimum conformance requirements

Same as in Clause 6.2.2.3.

6.2.2_2.4 Test description

6.2.2_2.4.1 Initial conditions

Same as in Clause 6.2.2.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

6.2.2_2.4.2 Test procedure

Same as in Clause 6.2.2.4.2.

6.2.2_2.4.3 Message contents

Same as in Clause 6.2.2.4.3.

6.2.2_2.5 Test requirement

Same as in Clause 6.2.2.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.2.2.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.2.3 E-UTRAN TDD - Contention Based Random Access Test

6.2.3.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.3.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE

Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.3.

6.2.3.4 Test description

6.2.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.3.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to Tables 6.2.3.5-1 and 6.2.3.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The UE set up a connection with SS, and the random access procedure used in the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response reception

   4.1 In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2 The UE shall consider the random access response reception not successful then re- select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4 The UE shall consider this random access response reception successful and transmit the msg3.

   4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3 and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

5. Test 2: Correct behaviour when *not* receiving random access response reception

   5.1 Repeat step 1-3.

   5.2 In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

5.3 The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 10 sub-frames.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful and transmit the msg3.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1 Repeat step 1-3.

6.2 In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

6.3 The UE shall consider this random access response reception successful and transmit the msg3.

6.4 The SS shall send NACK all UE msg3 following a successful random access response.

6.5 The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1 Repeat step 1-3.

7.2 In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after first preambles have been received by the SS.

7.3 The UE shall consider this random access response reception successful and transmit the msg3.

7.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1 Repeat step 1-3

8.2 In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

8.3 The UE shall consider this random access response reception successful and transmit the msg3.

8.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.5 The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1 Repeat step 1-3.

9.2 In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble have been received by the SS.

9.3 The UE shall consider this random access response reception successful and transmit the msg3.

9.4 The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

6.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.3.4.3-1: Common Exception messages for E-UTRAN TDD -Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.3.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.3.5 Test requirement

Tables 6.2.3.5-1 and 6.2.3.5-2 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.3.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.1/2 TDD Note 1	As defined in D.2.1/2.
PDSCH parameters Note 4		DL Reference Measurement Channel R.0 TDD Note 4	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.
Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the DUT is required.

Table 6.2.3.5-2: RACH-Configuration parameters for E-UTRAN TDD - Contention Based Random Access test

Field	Value	Comment
numberOfRA-Preambles	n52	
sizeOfRA-PreamblesGroupA	n52	No group B.
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 2: Correct behaviour when not receiving random access response reception

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.3.5-3: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Table 6.2.3.5-4: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.3.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.3_2 E-UTRAN TDD - Contention Based Random Access Test for UE Category 1bis

6.2.3_2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits for UE category 1bis.

6.2.3_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

6.2.3_2.3 Minimum conformance requirements

Same as in Clause 6.2.3.3.

6.2.3_2.4 Test description

6.2.3_2.4.1 Initial conditions

Same as in Clause 6.2.3.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

6.2.3_2.4.2 Test procedure

Same as in Clause 6.2.3.4.2.

6.2.3_2.4.3 Message contents

Same as in Clause 6.2.3.4.3.

6.2.3_2.5 Test requirement

Same as in Clause 6.2.3.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.2.3.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.2.4 E-UTRAN TDD - Non-Contention Based Random Access Test

6.2.4.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing are within the specified limits.

6.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.4.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if no Random Access Response is received within the RA response window.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.4.

6.2.4.4 Test description

6.2.4.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.4.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 6.2.4.5-1 and 6.2.4.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

4. Test 1: Correct behaviour when receiving Random Access Response

4.1. In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2 The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4 The UE shall consider this random access response reception successful.

4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

5. Test 2: Correct behaviour when *not* receiving Random Access Response

5.1 Repeat step 1-3.

5.2 In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

5.3 The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in clause Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

6.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.4.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.4.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC
}			

Table 6.2.4.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

Table 6.2.4.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.4.5 Test requirement

Tables 6.2.4.5-1 and 6.2.4.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test. Table 6.2.4.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 TDD	As defined in D.2.1.
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table 6.2.4.5-2: RACH-Configuration parameters for E-UTRAN TDD – Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Test 2: Correct behaviour when *not* receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Table 6.2.4.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Table 6.2.4.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.4.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.4_2 E-UTRAN TDD - Non-Contention Based Random Access Test for UE Category 1bis

6.2.4_2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits for UE category 1bis.

6.2.4_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

6.2.4_2.3 Minimum conformance requirements

Same as in Clause 6.2.4.3.

6.2.4_2.4 Test description

6.2.4_2.4.1 Initial conditions

Same as in Clause 6.2.4.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

6.2.4_2.4.2 Test procedure

Same as in Clause 6.2.4.4.2.

6.2.4_2.4.3 Message contents

Same as in Clause 6.2.4.4.3.

6.2.4_2.5 Test requirement

Same as in Clause 6.2.4.5 with the following exceptions:

- Antenna Configuration for the cell defined in Table 6.2.4.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.2.5 E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth

6.2.5.1 Test purpose

Same test purpose as defined in clause 6.2.1.1.

6.2.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support bands within band group FDD_N.

6.2.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.1.3 with the following exceptions:

- Instead of A.6.2.1 → use A.6.2.5.

6.2.5.4 Test description

6.2.5.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.5.4.2 Test procedure

Same test procedure as defined in clause 6.2.1.4.2 with the following exceptions:

- Instead of Table 6.2.1.5-1 → use Table 6.2.5.5-1.

6.2.5.4.3 Message contents

Same message contents as defined in clause 6.2.1.4.3.

6.2.5.5 Test requirement

Same test requirement as defined in clause 6.2.1.5 with the following exceptions:

Tables 6.2.5.5-1 and 6.2.1.5-2 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.1.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Contention Based Random Access test for 5MHz bandwidth

Parameter	Unit	Value	Comments
$BW_{channel}$	MHz	5	
OCNG Pattern Note 1		OP.15/16 FDD Note 1	As defined in D.1.15/16.
PDSCH parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As defined in A.2.1.
Io Note 2	dBm/4.5 MHz	**-68.5**	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.
Note 3: See Table 6.2.1.5-1 for the other parameters.
Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.

6.2.6 E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth

6.2.6.1 Test purpose

Same test purpose as defined in clause 6.2.2.1.

6.2.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support bands within band group FDD_N.

6.2.6.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.2.3 with the following exceptions:

- Instead of A.6.2.2 → use A.6.2.6.

6.2.6.4 Test description

6.2.6.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.6.4.2 Test procedure

Same test procedure as defined in clause 6.2.2.4.2 with the following exceptions:

- Instead of Table 6.2.2.5-1 → use Table 6.2.6.5-1.

6.2.6.4.3 Message contents

Same message contents as defined in clause 6.2.2.4.3.

6.2.6.5 Test requirement

Same test requirement as defined in clause 6.2.2.5 with the following exceptions:

Tables 6.2.6.5-1 and 6.2.2.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test for 5MHz bandwidth. Table 6.2.2.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test for 5MHz bandwidth

Parameter	Unit	Value	Comments
$BW_{channel}$	MHz	5	
OCNG Pattern Note 1		OP.15 FDD Note 1	As defined in D.1.15.
PDSCH parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As defined in A.2.1.
Io Note 2	dBm/4.5 MHz	-68.5	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: See Table 6.2.2.5-1 for the other parameters. Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG

6.2.7.1 Test purpose

To verify that the UE behaviour of the random access procedure, for the SCell, is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing, for the SCell, are within the specified limits.

6.2.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

6.2.7.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213 [8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321 [11]. Contention based random access procedures can only be carried out on PCell, while non-contention based random access procedures can be carried out on both PCell and an activated SCell.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213 [8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101 [2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2 and A.6.2.7.

6.2.7.4 Test description

6.2.7.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate for UE with 2Rx RF band and Annex A, Figure group TBD for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG).Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

6.2.7.4.2 Test procedure

This test consists of two cells. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 6.2.7.5-1 and 6.2.7.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall signal, on Cell 2, the SCell, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

7. Test 1: Correct behaviour when receiving Random Access Response

   7.1. In Test 1, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

   7.2. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

   7.3. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   7.4. The UE shall consider this random access response reception successful.

   7.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

8. Test 2: Correct behaviour when not receiving Random Access Response

   8.1. Repeat step 1-6.

   8.2. In Test 2, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

   8.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

   8.4. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   8.5. The UE shall consider this random access response reception successful.

   8.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

9. Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

   9.1. Repeat step 1-6.

   9.2. In Test 3, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 5 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

   9.3. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

   9.4. The SS shall still transmit on PCell Cell 1 a random access response containing a random access preamble identifier not corresponding to the transmitted random access after 5 preambles have been received by the SS.

   9.5. The UE shall consider this random access response reception not successful and stop to transmit the preamble on SCell Cell 2.

9.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 5 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

6.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.7.4.3-1: Common Exception messages for E-UTRAN FDD - Non-Contention Based Random Access for Scell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.7.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.7.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 6.2.7.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.7.4.3-5: *SCellToAddMod-r10:* Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 6.2.7.4.3-6: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
rach-ConfigCommonSCell-r11 SEQUENCE {			
powerRampingParameters-r11 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo-r11 SEQUENCE {			
preambleTransMax-r11	n6		
}			
}			
prach-ConfigSCell-r11 SEQUENCE {			
rootSequenceIndex	See TS 36.508 [18] clause 4.4.2, Table 4.4.2-1A and clause 6.3.2.2 Table 6.3.2.2-2	See table 5.7.2-4 in TS 36.211 [41] for PRACH format 0-3	FDD
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		FDD
highSpeedFlag	FALSE		
zeroCorrelationZoneConfig			
prach-FreqOffset	See TS 36.508 [18] clause 4.6.8	Channel-bandwidth-dependent parameter	
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 6.2.7.4.3-7: *RadioResourceConfigDedicatedSCell-r10*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

6.2.7.5 Test requirement

Tables 6.2.7.5-1 and 6.2.7.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test for SCell. Table 6.2.7.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number		1	2	
$BW_{channel}$	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF channel number 1.
Active SCell			Cell 2	Secondary cell of RF channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG configures Cell 1 and Cell 2 to separate TAGs
OCNG Pattern		OP.1 FDD	OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	0	
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	3	3	
N_{oc}	dBm/15 KHz	-98	-98	
$\hat{E}_s / N_{oc}$	dB	3	3	
Io Note 2	dBm/9 MHz	-65.5	-65.5	
RSRP Note 3	dBm/15 KHz	-95	-95	
referenceSignalPower	dBm/15 KHz	-5	-5	As defined in clause 6.3.2 in TS 36.331 [5].
Configured UE transmitted power ($P_{CMAX,c}$)	dBm	23	23	As defined in clause 6.2.5 in TS 36.101 [2].
PRACH Configuration Index	-	4	4	As defined in table 5.7.1-2 in TS 36.211 [9].
Backoff Parameter Index	-	2	2	As defined in table 7.2-1 in TS 36.321 [11].
Propagation Condition	-	AWGN	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table 6.2.7.5-2: RACH-Configuration parameters for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Clause 6.3.2 in TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Table 6.2.7.5-3: Absolute power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Conditions	Tolerance
Normal	± 10.5 dB
Extreme	± 13.5 dB

Table 6.2.7.5-4: Relative power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.7.5-5: Test requirements for Te Timing Error Limit for E-UTRAN FDD – Non-Contention Based Random Access test for SCell

Downlink Bandwidth (MHz)	T_e
≥3	15*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG

6.2.8.1 Test purpose

To verify that the UE behaviour of the random access procedure, for the SCell, is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing, for the SCell, are within the specified limits.

6.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

6.2.8.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213 [8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321 [11]. Contention based random access procedures can only be carried out on PCell, while non-contention based random access procedures can be carried out on both PCell and an activated SCell.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213 [8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101 [2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2 and A.6.2.8.

6.2.8.4 Test description

6.2.8.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate for UE with 2Rx RF band and Annex A, Figure group TBD for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG).Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

6.2.8.4.2 Test procedure

This test consists of two cells. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Tables 6.2.8.5-1 and 6.2.8.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall signal, on Cell 2, the SCell, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.
7. Test 1: Correct behaviour when receiving Random Access Response

   7.1. In Test 1, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

   7.2. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

   7.3. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   7.4. The UE shall consider this random access response reception successful.

   7.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.
8. Test 2: Correct behaviour when not receiving Random Access Response

   8.1. Repeat step 1-6.

   8.2. In Test 2, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

   8.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

   8.4. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   8.5. The UE shall consider this random access response reception successful.

   8.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.
9. Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

   9.1. Repeat step 1-6.

   9.2. In Test 3, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 5 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

9.3. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

9.4. The SS shall still transmit on PCell Cell 1 a random access response containing a random access preamble identifier not corresponding to the transmitted random access after 5 preambles have been received by the SS.

9.5. The UE shall consider this random access response reception not successful and stop to transmit the preamble on SCell Cell 2.

9.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 5 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

6.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.8.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access for Scell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.8.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.8.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 6.2.8.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.8.4.3-5: *SCellToAddMod-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 6.2.8.4.3-6: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
rach-ConfigCommonSCell-r11 SEQUENCE {			
powerRampingParameters-r11 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo-r11 SEQUENCE {			
preambleTransMax-r11	n6		
}			
}			
prach-ConfigSCell-r11 SEQUENCE {			
rootSequenceIndex	See TS 36.508 [18] clause 4.4.2, Table 4.4.2-1A and clause 6.3.2.2 Table 6.3.2.2-2	See table 5.7.2-5 in TS 36.211 [41] for PRACH format 4	
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		
highSpeedFlag	FALSE		
zeroCorrelationZoneConfig			
prach-FreqOffset	See TS 36.508 [18] clause 4.6.8	Channel-bandwidth-dependent parameter	
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 6.2.8.4.3-7: *RadioResourceConfigDedicatedSCell-r10*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

6.2.8.5 Test requirement

Tables 6.2.8.5-1 and 6.2.8.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test for SCell. Table 6.2.8.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.8.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number	-	1	1	
$BW_{channel}$	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF channel number 1.
Active SCell			Cell 2	Secondary cell of RF channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG configures Cell 1 and Cell 2 to separate TAGs
OCNG Pattern	-	OP.1 TDD	OP.1 TDD	As defined in D.2.1.
PDSCH parameters	-	DL Reference Measurement Channel R.0 TDD	DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters	-	DL Reference Measurement Channel R.6 TDD	DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	6	As specified in table 4.2-1 in TS 36.211 [9].
Uplink-downlink configuration	-	1	1	As specified in table 4.2-2 in TS 36.211 [9].
PBCH_RA	dB	0	0	
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s / I_{ot}$	dB	3	3	
N_{oc}	dBm/15 KHz	-98	-98	
$\hat{E}_s / N_{oc}$	dB	3	3	
Io Note 2	dBm/9 MHz	-65.5	-65.5	
RSRP Note 3	dBm/15 KHz	-95	-95	
referenceSignalPower	dBm/15 KHz	-5	-5	As defined in clause 6.3.2 in TS 36.331 [5].
Configured UE transmitted power ($P_{CMAX,c}$)	dBm	23	23	As defined in clause 6.2.5 in TS 36.101 [2].
PRACH Configuration Index	-	53	53	As defined in table 5.7.1-3 in TS 36.211 [9].
Backoff Parameter Index	-	2	2	As defined in table 7.2-1 in TS 36.321 [11].
Propagation Condition	-	AWGN	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table 6.2.8.5-2: RACH-Configuration parameters for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Clause 6.3.2 in TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Table 6.2.8.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Conditions	Tolerance
Normal	± 10.5 dB
Extreme	± 13.5 dB

Table 6.2.8.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.8.5-5: Test requirements for Te Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test for SCell

Downlink Bandwidth (MHz)	T_e
≥3	15*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.9 3DL/3UL TDD CA Non-Contention Based Random Access Test for 2 SCells

6.2.9.1 Test purpose

To verify that the UE behaviour of the random access procedure, for the two SCells, is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing, for the SCell, are within the specified limits.

6.2.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

6.2.9.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213 [8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321 [11]. Contention based random access procedures can only be carried out on PCell and PSCell, while non-contention based random access procedures can be carried out on both PCell, one or two activated SCell(s), and PSCell.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213 [8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101 [2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2 and A.6.2.9.

6.2.9.4 Test description

6.2.9.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 6.2.9.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

1. Propagation conditions are set according to Annex B clause B.0.

2. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell1 and Cell 3 is SCell2. PCell and SCell1/SCell2 are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG). Cell 2 and Cell 3 are in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

6.2.9.4.2 Test procedure

This test consists of three cells. Cell 1 is PCell, Cell 2 is SCell1 and Cell 3 is SCell2. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG). Cell 2 and Cell 3 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow SCell 1 and SCell 2 to be configured and to handle the Random Access Response which takes place on PCell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell1 and SCell2 according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell1 (Cell 2) on the SCC1 and SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with UL CA.

4. The SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 6.2.9.5-1 and 6.2.9.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. Test 1: Correct behaviour when receiving Random Access Response

   6.1. The SS shall signal, on Cell 2, the SCell1, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

   6.2. The UE shall send, on Cell 2, the SCell1, the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

   6.3. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell1 Cell 2 with the calculated PRACH transmission power.

   6.4. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   6.5. The UE shall consider this random access response reception successful.

   6.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.9.5-3 and 6.2.9.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

   6.7. Repeat 6.1 – 6.6 with replace Cell 2 (SCell1) to Cell 3 (SCell2).

7. Test 2: Correct behaviour when not receiving Random Access Response

   7.1. Repeat step 1-5.

   7.2. The SS shall signal, on Cell 2, the SCell1, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

   7.3. The UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

   7.4. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

7.5. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

7.6. The UE shall consider this random access response reception successful.

7.7. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.9.5-3 and 6.2.9.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

7.8. Repeat 7.2 – 7.7 with replace Cell 2 (SCell1) to Cell 3 (SCell2).

8. Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

8.1. Repeat step 1-5.

8.2. The SS shall signal, on Cell 2, the SCell1, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

8.3. In Test 3, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 5 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

8.4. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

8.5. The SS shall still transmit on PCell Cell 1 a random access response containing a random access preamble identifier not corresponding to the transmitted random access after 5 preambles have been received by the SS.

8.6. The UE shall consider this random access response reception not successful and stop to transmit the preamble on SCell Cell 2.

8.7. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.9.5-3 and 6.2.9.5-5. Measure the relative power and timing applied to additional preambles (last 5 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

8.8. Repeat 8.2 – 8.7 with replace Cell 2 (SCell1) to Cell 3 (SCell2).

6.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.9.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access for Scell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.9.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.9.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	Infinity		
}			
}			

Table 6.2.9.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.9.4.3-5: *SCellToAddMod-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
sCellIndex-r10	2		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 3		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 3		
}			
}			

Table 6.2.9.4.3-6: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
rach-ConfigCommonSCell-r11 SEQUENCE {			
powerRampingParameters-r11 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo-r11 SEQUENCE {			
preambleTransMax-r11	n6		
}			
}			
prach-ConfigSCell-r11 SEQUENCE {			
rootSequenceIndex	See TS 36.508 [18] clause 4.4.2, Table 4.4.2-1A and clause 6.3.2.2 Table 6.3.2.2-2	See table 5.7.2-5 in TS 36.211 [41] for PRACH format 4	
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		
highSpeedFlag	FALSE		
zeroCorrelationZoneConfig			
prach-FreqOffset	See TS 36.508 [18] clause 4.6.8	Channel-bandwidth-dependent parameter	
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 6.2.9.4.3-7: *RadioResourceConfigDedicatedSCell-r10*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

6.2.9.5 Test requirement

Tables 6.2.9.5-1 and 6.2.9.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test for SCell1 and SCell2. Table 6.2.9.5-5 defines the uplink timing error limit including test tolerances.

Table A.6.2.9.5-1: General test parameters for 3DL/3UL TDD CA non-contention based random access test

Parameter	Unit	Cell 1	Cell 2	Cell 3	Comments
E-UTRA RF Channel Number	-	1	2	3	
$BW_{channel}$	-	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	
TAG configuration	-	pTAG	sTAG	sTAG	Cell 2 and Cell 3 are in the same sTAG
PDSCH parameters: DL Reference Measurement Channel	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel	-	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	As defined in A.2.2.
OCNG Patterns	-	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	As defined in D.2
Special subframe configuration	-	6	6	6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration	-	1	1	1	As specified in table 4.2-2 in TS 36.211 [9]
PBCH_RA	dB	0	0	0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	3	3	3	
N_{oc}	dBm/15 KHz	-98	-98	-98	
$\hat{E}_s / N_{oc}$	dB	3	3	3	
Io Note 2	dBm/ $BW_{channel}$	-65.5+10log ($N_{RB,c}$ /50)	-65.5+10log ($N_{RB,c}$ /50)	-65.5+10log ($N_{RB,c}$ /50)	
RSRP Note 3	dBm/15 KHz	-95	-95	-95	
referenceSignalPower	dBm/15 KHz	-5	-5	-5	As defined in clause 6.3.2 in TS 36.331 [5].
Configured UE transmitted power ($P_{CMAX,c}$)	dBm	23	23	23	As defined in clause 6.2.5 in TS 36.101 [2].
PRACH Configuration Index	-	53	53	53	As defined in table 5.7.1-3 in TS 36.211 [9].
Backoff Parameter Index	-	2	2	2	As defined in table 7.2-1 in TS 36.321 [11].
Propagation Condition	-	AWGN	AWGN	AWGN	
Antenna Configuration		1x2	1x2	1x2	

Timing offset to Cell 1	µs	-	0	0	
Time alignment error relative to cell 1 Note 4	µs	-	≤ TAE	≤ TAE	
Time alignment error relative to cell 2 Note 4	µs	-	-	≤ TAE	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter. Note 4: The time alignment error (TAE) between two cells specified in TS36.104 [29] clause 6.5.3.1 (value depends upon the type of carrier aggregation). Note 5: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.					

Table 6.2.9.5-2: RACH-Configuration parameters for cell2 and cell3 for 3DL/3UL TDD CA non-contention based random access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
Note 1: For further information see Clause 6.3.2 in TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

For Cell 2:

- The power of the first preamble shall be -22 dBm to within the accuracy specified Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

For Cell 3:

- The power of the first preamble shall be -22 dBm to within the accuracy specified Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

For Cell 2:

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

For Cell 3:

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

For Cell2:

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

For Cell3:

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.9.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.9.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.9.5-5.

Table 6.2.9.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCells

Conditions	Tolerance
Normal	± 10.5 dB
Extreme	± 13.5 dB

Table 6.2.9.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCells

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.9.5-5: Test requirements for Te Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test for SCells

Downlink Bandwidth (MHz)	T_e
≥3	15*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.10 E-UTRAN FDD - Contention based random access test for CE UEs in normal coverage

6.2.10.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a CE UE in Normal Coverage is according to the E-UTRAN FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.2.10.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

In addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources [5] configured for the corresponding enhanced coverage level as determined in the previous step;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.10.

The test parameters are given in Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3.

6.2.10.4 Test description

6.2.10.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.10.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the UE.

1. Ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3 as appropriate where CE level 0 shall be used. Propagation conditions are set according to Annex B clause B.1.1.
3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response

   4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.10.5-4 and 6.2.10.5-6. The power of the first preamble shall be -24.3dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

5. Test 2: Correct behaviour when not receiving random access response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 20 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The UE shall consider this random access response reception successful and transmit the msg3.

5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.10.5-4 and 6.2.10.5-6. The power of the first preamble shall be -24.3dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1. Repeat step 1-3.

6.2. In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

6.3. The UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the UE shall send the preamble to the SS.

10.3. The UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 0. The SS shall verify that the UE is transmitting at coverage level 0.

6.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.10.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1a Table H.2.6-2 Table H.2.6-3 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1 Table H.7.1-2

Table 6.2.10.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD – Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.10.4.3-3: *RACH-ConfigCommon-DEFAULT*: E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
preamblesGroupAConfig SEQUENCE {			
sizeOfRA-PreamblesGroupA	n52	No group B	
}			
}			
}			
RACH-CE-LevelInfoList-r13 ::= SEQUENCE (SIZE (1..maxCE-Level-r13)) OF SEQUENCE {			
preambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
preambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
}			

Table 6.2.10.4.3-4: *PRACH-Config-v1310-DEFAULT*: E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entry		NC
RSRP-Range[1]	24	-116 dBm	
RSRP-Range[2]	27	-113 dBm	
RSRP-Range[3]	31	-109 dBm	
}			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entry		EC
RSRP-Range[1]	21	-119 dBm	
RSRP-Range[2]	24	-116 dBm	
RSRP-Range[3]	28	-112 dBm	
}			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries	1: CE level 0 2: CE level 1 3: CE level 2 4: CE level 3	
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	4		FDD
	53		TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	4		FDD
	53		TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	4		FDD
	53		TDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf16		
maxNumPreambleAttemptCE-r13[3]	n7		
numRepetitionPerPreambleAttempt-r13[3]	n16		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[3]	r128		
prach-HoppingConfig-r13[3]	off		

}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	4		FDD
	53		TDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf64		
maxNumPreambleAttemptCE-r13[4]	n10		
numRepetitionPerPreambleAttempt-r13[4]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[4]	r128		
prach-HoppingConfig-r13[4]	off		
}			
}			
}			

Condition	Explanation
NC	Normal Environmental Conditions
EC	Extreme Environmental Conditions
FDD	FDD cell environment
TDD	TDD cell environment

6.2.10.5 Test requirement

Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.10.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.10.4.2, the power of the first preamble shall be -24.3dBm to within the accuracy specified in Table 6.2.10.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

Table 6.2.10.5-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.20 FDD	As defined in TS 36.133 [4] clause A.3.1.4.1
MPDCCH parameters Note 2		R.16 FDD	As defined in TS 36.133 [4] clause A.3.1.3.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in TS 36.133 [4] clause A.3.1.2.1
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-103.4	
$\hat{E}_s / N_{oc}$	dB	2.7	
$\hat{E}_s / I_{ot}$ Note 3	dB	2.7	
RSRP Note 3	dBm/15 KHz	-100.7	
Io Note 3	dBm/9 MHz	-71.05	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.10.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.10.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	Normal Conditions: {24, 27, 31}				Corresponding to {-116, -113, -109} dBm as defined in TS 36.133 [4] clause 9.1.21.5
	Extreme Conditions: {21, 24, 28}				Corresponding to {-119, -116, -112} dBm as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.10.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.10.2 and TS 36.101 [2] clause 6.3.5.1.1.	

Table 6.2.10.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	±3.7	± 5.7
Note 1: F3.2 and TS 36.133 [4] clause A.6.2.10.2 and TS 36.101 [2] clause 6.3.5.2.1. Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations.		

Table 6.2.10.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
10	$27*T_S$
Note 1: F3.2 and TS 36.133 [4] clauses A.6.2.10.2 and clause 7.1.2, where T_e of 1.4MHz is used for CEMode A regardless of the downlink carrier bandwidth. Note 2: T_S is the basic timing unit defined in TS 36.211 [9].	

6.2.11 E-UTRAN HD-FDD - Contention based random access test for CE UEs in normal coverage

6.2.11.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a UE in Normal Coverage is according to the E-UTRAN HD-FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.11.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.2.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.10.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.11.

The test parameters are given in Tables 6.2.11.5-1, 6.2.11.5-2 and 6.2.11.5-3.

6.2.11.4 Test description

6.2.11.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.11.4.2 Test procedures

Same test procedure as in clause 6.2.10.4.2 with the following exceptions:

- Instead of Tables 6.2.10.5-1 → use Tables 6.2.11.5-1.
- Instead of Tables 6.2.10.5-2 → use Tables 6.2.11.5-2.
- Instead of Tables 6.2.10.5-3 → use Tables 6.2.11.5-3.
- Instead of Tables 6.2.10.5-4 → use Tables 6.2.11.5-4.
- Instead of Tables 6.2.10.5-5 → use Tables 6.2.11.5-5.
- Instead of Tables 6.2.10.5-6 → use Tables 6.2.11.5-6.

6.2.11.4.3 Message contents

Same as in clause 6.2.10.4.3.

6.2.11.5 Test requirement

Tables 6.2.11.5-1, 6.2.11.5-2 and 6.2.11.5-3 define the primary level settings for E-UTRAN HD-FDD - contention based random access test. Table 6.2.11.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.11.4.2, the power of the first preamble shall be -24.3dBm to within the accuracy specified in Table 6.2.11.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.11.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.11.5-6.

Table 6.2.11.5-1: General test parameters for HD-FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.10 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.4.2
MPDCCH parameters Note 2		R.6 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.3.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.2.3
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-103.4	
$\hat{E}_s / N_{oc}$	dB	2.7	
$\hat{E}_s / I_{ot}$ Note 3	dB	2.7	
RSRP Note 3	dBm/15 KHz	-100.7	
Io Note 3	dBm/9 MHz	-71.05	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.11.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.11.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	Normal Conditions: {24, 27, 31}				Corresponding to {-116, -113, -109} dBm as defined in TS 36.133 [4] clause 9.1.21.5
	Extreme Conditions: {21, 24, 28}				Corresponding to {-119, -116, -112} dBm as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.11.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.11.2 and TS 36.101 [2] clause 6.3.5.1.1.	

Table 6.2.11.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: F3.2 and TS 36.133 [4] clause A.6.2.11.2 and TS 36.101 [2] clause 6.3.5.2.1. Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations.		

Table 6.2.11.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
10	$27*T_S$
Note 1: F3.2 and TS 36.133 [4] clauses A.6.2.11.2 and clause 7.1.2, where T_e of 1.4MHz is used for CEMode A regardless of the downlink carrier bandwidth.. Note 2: T_S is the basic timing unit defined in TS 36.211 [9].	

6.2.12 E-UTRAN TDD Contention Based Random Access Test for CE UEs in Normal Coverage

6.2.12.1 Test purpose

To verify whether the behaviour of the random access procedure of a UE in Normal Coverage is according to the E-UTRAN TDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.1.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

6.2.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.10.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.12.

The test parameters are given in Tables 6.2.12.5-1, 6.2.12.5-2 and 6.2.12.5-3.

6.2.12.4 Test description

6.2.12.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18(using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.12.4.2 Test procedure

Same test procedure as in clause 6.2.10.4.2 with the following exceptions:

- Instead of Tables 6.2.10.5-1 → use Tables 6.2.12.5-1.
- Instead of Tables 6.2.10.5-2 → use Tables 6.2.12.5-2.
- Instead of Tables 6.2.10.5-3 → use Tables 6.2.12.5-3.
- Instead of Tables 6.2.10.5-4 → use Tables 6.2.12.5-4.
- Instead of Tables 6.2.10.5-5 → use Tables 6.2.12.5-5.
- Instead of Tables 6.2.10.5-6 → use Tables 6.2.12.5-6.

6.2.12.4.3 Message contents

Same as in clause 6.2.10.4.3.

6.2.12.5 Test requirement

Tables 6.2.12.5-1, 6.2.12.5-2 and 6.2.12.5-3 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.12.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.12.4.2, the power of the first preamble shall be -24.3dBm to within the accuracy specified in Table 6.2.12.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.12.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.12.5-6.

Table 6.2.12.5-1: Cell Specific Test requirement parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.11 TDD	As defined in TS 36.133 [4] clause A.3.2.2.11.
PDSCH parameters Note 2		R.16 TDD	As defined in TS 36.133 [4] clause A.3.1.4.3
MPDCCH parameters Note 2		R.14 TDD	As defined in TS 36.133 [4] clause A.3.1.3.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in TS 36.133 [4] clause A.3.1.2.2
Special subframe configuration	-	6	As specified in table 4.2-1 in TS 36.211 [11].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211 [11].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-103.4	
$\hat{E}_s / N_{oc}$	dB	2.7	
$\hat{E}_s / I_{ot}$ Note 3	dB	2.7	
RSRP Note 3	dBm/15 KHz	-100.7	
Io Note 3	dBm/9 MHz	-71.05	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.12.5-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
numberOfRA-Preambles	n52				
sizeOfRA-PreamblesGroupA	n52				No group B.
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note 1: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.12.5-3: PRACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	Normal Conditions: {24, 27, 38}				Corresponding to {-116, -113, -109} dBm as defined in Section 9.1.21.5
	Extreme Conditions: {21, 24, 28}				Corresponding to {-119, -116, -112} dBm as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	**Level 0**	**Level 1**	**Level 2**	**Level 3**	
prach-ConfigIndex	53	53	53	53	As defined in table 5.7.1-3 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.12.5-4: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Note: TS 36.133 [4] clause A.6.2.12.2 and TS 36.101 [2] clause 6.3.5.1.1

Table 6.2.12.5-5: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
$2 \leq \Delta P < 3$	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.12.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.12.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
1.4	$27*T_S$
≥3	$15*T_S$
Note 1: TS 36.133 [4] clauses A.6.2.12.2 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.13 E-UTRAN FDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage

6.2.13.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a UE in Enhanced Coverage is according to the E-UTRAN FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.13.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

6.2.13.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

Per TS 36.133 [4] clause 6.2.3, in addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources (TS 36.331 [5]) configured for the corresponding enhanced coverage level as determined in the previous step and;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.13.

The test parameters are given in Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3.

6.2.13.4 Test description

6.2.13.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.13.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the UE.

1. Ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3 as appropriate where CE level 2 shall be used. Propagation conditions are set according to Annex B clause B.1.1.

3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response

   4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles (the preamble may be transmitted multiple times in each attempt) have been received by the SS.

   4.4. The UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.13.5-4 and 6.2.13.5-6. The power of the first preamble shall be -26.5 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

5. Test 2: Correct behaviour when not receiving random access response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 80 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.13.5-4 and 6.2.13.5-6. The power of the first preamble shall be -26.5 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

6. Test 3: Not applicable.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

   7.1. Repeat step 1-3.

   7.2. In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   7.3. The UE shall consider this random access response reception successful and transmit the msg3.

   7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in msg3 uplink message.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the UE shall send the preamble to the SS.

10.3. The UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 2. The SS shall verify that the UE is transmitting at coverage level 2.

6.2.13.4.3 Message contents

Same as in clause 6.2.10.4.3 with the following exceptions:

Table 6.2.13.4.3-1: Void

Table 6.2.13.4.3-2: Void

Table 6.2.13.4.3-3: Exceptions in PRACH-ConfigSIB-v1310-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7b PRACH-ConfigSIB-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries	Threshold values to determine the CE Level 1, 2 and 3 for PRACH. RSRP-Range values according to mapping table in TS 36.133[4] Table 9.1.14.3.3-1.	CEModeB PRACH_4CE AND NC
RSRP-Range[1]	47	-93 dBm	
RSRP-Range[2]	38	-102 dBm	
RSRP-Range[3]	21	-119 dBm	
}			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries	Threshold values to determine the CE Level 1, 2 and 3 for PRACH. RSRP-Range values according to mapping table in TS 36.133[4] Table 9.1.14.3.3-1.	CEModeB PRACH_4CE AND EC
RSRP-Range[1]	50	-90 dBm	
RSRP-Range[2]	41	-99 dBm	
RSRP-Range[3]	18	-122 dBm	
}			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries	1: CE Level 0 2: CE Level 1 3: CE Level 2 4: CE Level 3	CEModeB PRACH_4CE
prach-ConfigIndex-r13[1]	4		FDD
	53		TDD
prach-FreqOffset-r13[1]	0		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	Off		
prach-ConfigIndex-r13[2]	4		FDD
	53		TDD
prach-FreqOffset-r13[2]	0		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	Off		
prach-ConfigIndex-r13[3]	4		FDD
	53		TDD
prach-FreqOffset-r13[3]	0		
prach-StartingSubframe-r13[3]	sf16		
maxNumPreambleAttemptCE-r13[3]	n7		
numRepetitionPerPreambleAttempt-r13[3]	n16		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3]	1 entry		

mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[3]	r128		
prach-HoppingConfig-r13[3]	Off		
prach-ConfigIndex-r13[4]	4		FDD
	53		TDD
prach-FreqOffset-r13[4]	0		
prach-StartingSubframe-r13[4]	sf64		
maxNumPreambleAttemptCE-r13[4]	n10		
numRepetitionPerPreambleAttempt-r13[4]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[4]	r128		
prach-HoppingConfig-r13[4]	Off		
}			
}			

Condition	Explanation
FDD	FDD cell environment
RF	Used for RF, performance and RRM testing
CEmodeB	Used for CE mode B testing using 4 CE levels
PRACH_4CE	Used for RRM testing using reference PRACH Configurations PRACH_4CE in TS 36.521-3 clause A.9
NC	Normal Environmental Conditions
EC	Extreme Environmental Conditions

Table 6.2.13.4.3-4: Exceptions in RACH-ConfigCommon-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: 36.508 [7] clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
RACH-CE-LevelInfo-r13			CEModeB
preambleMappingInfoList-r13 SEQUENCE (SIZE (1..maxCE-Level-r13)) OF PreambleMappingInfo-r13	4 entries		
PreambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
PreambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
PreambleMappingInfo-r13[3] SEQUENCE {			
firstPreamble-r13	20		
lastPreamble-r13	29		
}			
PreambleMappingInfo-r13[4] SEQUENCE {			
firstPreamble-r13	30		
lastPreamble-r13	39		
}			
}			
rar-HoppingConfigInfoList-r13	Off		
}			
}			

6.2.13.5 Test requirement

Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.13.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.13.4.2, the power of the first preamble shall be -26.5 dBm to within the accuracy specified in Table 6.2.13.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

Table 6.2.13.5-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.22 FDD	As defined in TS 36.133 [4] clause A.3.1.4.4
MPDCCH parameters Note 2		R.18 FDD	As defined in TS 36.133 [4] clause A.3.1.3.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in TS 36.133 [4] clause A.3.1.2.1
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-99.1	
$\hat{E}_s / N_{oc}$	dB	-11.4	
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.4	
RSRP Note 3	dBm/15 KHz	-110.5	
Io Note 3	dBm/9 MHz	-71.01	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.13.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.13.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{21, 38, 47} for normal conditions and {18, 41, 50} for extreme conditions				Corresponding to {-119, -102, -93} dBm for nomal and {-122, -99, -90} for extreme as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.13.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.13.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.13.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.13.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.13.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

CEMode	T_e
B	$51*T_S$
Note 1: TS 36.133 [4] clauses A.6.2.13.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.14 E-UTRAN HD-FDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage

6.2.14.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a UE in Enhanced Coverage is according to the E-UTRAN HD-FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

6.2.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.13.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.14.

The test parameters are given in Tables 6.2.14.5-1, 6.2.14.5-2 and 6.2.14.5-3.

6.2.14.4 Test description

6.2.14.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.14.4.2 Test procedures

Same test procedure as in clause 6.2.13.4.2 with the following exceptions:

- Instead of Tables 6.2.13.5-1 → use Tables 6.2.14.5-1.
- Instead of Tables 6.2.13.5-2 → use Tables 6.2.14.5-2.
- Instead of Tables 6.2.13.5-3 → use Tables 6.2.14.5-3.
- Instead of Tables 6.2.13.5-4 → use Tables 6.2.14.5-4.
- Instead of Tables 6.2.13.5-5 → use Tables 6.2.14.5-5.
- Instead of Tables 6.2.13.5-6 → use Tables 6.2.14.5-6.

6.2.14.4.3 Message contents

Same as in clause 6.2.13.4.3.

6.2.14.5 Test requirement

Tables 6.2.14.5-1, 6.2.14.5-2 and 6.2.14.5-3 define the primary level settings for E-UTRAN HD-FDD - contention based random access test. Table 6.2.14.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.14.4.2, the power of the first preamble shall be -26.5 dBm to within the accuracy specified in Table 6.2.14.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.14.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.14.5-6.

Table 6.2.14.5-1: General test parameters for HD-FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.12 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.4.5
MPDCCH parameters Note 2		R.8 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.3.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.2.3
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-99.1	
$\hat{E}_s / N_{oc}$	dB	-11.4	
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.4	
RSRP Note 3	dBm/15 KHz	-110.5	
Io Note 3	dBm/9 MHz	-71.01	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.14.5-2: RACH-Configuration parameters for HD-FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.14.5-3: PRACH-Configuration parameters for HD-FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{21, 38, 47} for normal conditions and {18, 41, 50} for extreme conditions				Corresponding to {-119, -102, -93} dBm for nomal and {-122, -99, -90} for extreme as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.14.5-4: Absolute power tolerance for E-UTRAN HD-FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	±13.5 dB
Note: TS 36.133 [4] clause A.6.2.14.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.14.5-5: Relative power tolerance for E-UTRAN HD-FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.14.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.14.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN HD-FDD – Contention Based Random Access test

CEMode	T_e
B	$51*T_S$
Note 1: TS 36.133 [4] clauses A.6.2.14.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.15 E-UTRAN TDD - Contention Based Random Access Test for CE UEs in Enhanced Coverage

6.2.15.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a UE in Enhanced Coverage is according to the E-UTRAN TDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.15.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

6.2.15.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.13.3.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.15.

The test parameters are given in Tables 6.2.15.5-1, 6.2.15.5-2 and 6.2.15.5-3.

6.2.15.4 Test description

6.2.15.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.15.4.2 Test procedures

Same test procedure as in clause 6.2.13.4.2 with the following exceptions:

- Instead of Tables 6.2.13.5-1 → use Tables 6.2.15.5-1.
- Instead of Tables 6.2.13.5-2 → use Tables 6.2.15.5-2.
- Instead of Tables 6.2.13.5-3 → use Tables 6.2.15.5-3.
- Instead of Tables 6.2.13.5-4 → use Tables 6.2.15.5-4.
- Instead of Tables 6.2.13.5-5 → use Tables 6.2.15.5-5.
- Instead of Tables 6.2.13.5-6 → use Tables 6.2.15.5-6.

6.2.15.4.3 Message contents

Same as in clause 6.2.13.4.3.

6.2.15.5 Test requirement

Tables 6.2.15.5-1, 6.2.15.5-2 and 6.2.15.5-3 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.15.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.15.4.2, the power of the first preamble shall be -26.5 dBm to within the accuracy specified in Table 6.2.15.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.15.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.15.5-6.

Table 6.2.15.5-1: General test parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.11 TDD	As defined in TS 36.133 [4] clause A.3.2.2.11.
PDSCH parameters Note 2		R.18 TDD	As defined in TS 36.133 [4] clause A.3.1.4.6
MPDCCH parameters Note 2		R.16 TDD	As defined in TS 36.133 [4] clause A.3.1.3.6
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in TS 36.133 [4] clause A.3.1.2.2
Special subframe configuration	-	6	As specified in table 4.2-1 in TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-99.1	
$\hat{E}_s / N_{oc}$	dB	-11.4	
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.4	
RSRP Note 3	dBm/15 KHz	-110.5	
Io Note 3	dBm/9 MHz	-71.01	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.15.5-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
numberOfRA-Preambles	n52				
sizeOfRA-PreamblesGroupA	n52				No group B.
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.15.5-3: PRACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{21, 38, 47} for normal conditions and {18, 41, 50} for extreme conditions				Corresponding to {-119, -102, -93} dBm for nomal and {-122, -99, -90} for extreme as defined in TS 36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	Maximum value allowed by the applicable UE power class				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.15.5-4: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.15.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.15.5-5: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.15.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.15.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

CEMode	T_e
B	$51*T_S$
Note 1: TS 36.133 [4] clauses A.6.2.15.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.16 Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage

6.2.16.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Normal Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.16.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

6.2.16.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and NB-IoT. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. The UE category NB1 supports only contention-based random access transmission on anchor carrier and on non-anchor carrier..

The requirements in this section are applicable for the random access transmission by the UE category NB1 to an anchor carrier or to a non-anchor carrier under the following conditions:

- The anchor and non-anchor carrier frequencies are within 20 MHz and
- The anchor and the non-anchor carrier frequencies are in the same base station or in co-located base stations.

The UE shall have capability to calculate NPRACH transmission power according to the NPRACH power formula defined in TS 36.213[8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in TS 36.101[2]. The relative power applied to additional preambles shall have an accuracy as specified in 36.101[2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on target cell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321[11].

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [17] using the NPRACH configuration contained in *NPRACH-ConfigSIB-NB* in TS 36.331 [2].

The UE shall apply the following procedure:

- Determines the enhanced coverage level based on the NRSRP intra-frequency measurement performed on the anchor carrier, for NPRACH transmission to the anchor carrier or for NPRACH transmission to the non-anchor carrier, and the configured criterion as defined in section 5.1.1, TS 36,321 [17],
- Selects NPRACH resources [2] configured for the corresponding enhanced coverage level as determined in the previous step and;
- Transmits or re-transmits NPRACH preamble using the selected NPRACH resources and NPRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.6.2 and A.6.2.16.

6.2.16.4 Test description

6.2.16.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 6.2.16.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.51 using only main Tx/Rx antenna and without fading.
2. Propagation conditions are set according to Annex B clause B.0.
3. There are one NB-IoT carrier and one E-UTRA FDD carrier and two cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.16.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with one Cell and one NB-IoT carrier with 1 Ncell.

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.
2. Set the parameters according to Tables 6.2.16.5-1 to 6.2.16.5-3 selecting values appropriate to the test condition of normal or extreme. Propagation conditions are set according to Annex B clause B.1.1.
3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response reception

4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 2 preamble transmission attempts (the preamble is transmitted 2 times in each attempt), the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 3 preamble transmission attempts have been received by the SS.

4.4. The UE shall consider this random access response reception successful and transmit the msg3.

4.5. Measure the power and timing of the first preamble transmission attempt. The power of the first preamble transmission attempt shall be -25 dBm with the accuracy specified in Table 6.2.16.5-4. Measure the relative power and timing applied to additional preamble transmission attempts. The relative power of the last 2 preamble transmission attempts shall not exceed the values specified in Tables 6.2.16.5-5. The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.16.5-6. If the UE transmits or re- transmits NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power, relative power and timing are only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

5. Test 2: Correct behaviour when not receiving random access response reception

5.1. Repeat step 1-3.

5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first2 preamble transmission attempts (the preamble is transmitted 2 times in each attempt).

5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 12 sub-frames.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 3 preamble transmission attemps have been received by the SS.

5.5. The UE shall consider this random access response reception successful and transmit the msg3.

5.6. Measure the power and timing of the first preamble transmission attempt. The power of the first preamble transmission attempt shall be -25dBm with the accuracy specified in Table 6.2.16.5-4. Measure the relative power and timing applied to additional preamble transmission attempts. The relative power of the last 2 preamble transmission attempts shall not exceed the values specified in Tables 6.2.16.5-5. The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.16.5-6. If the UE transmits or re- transmits NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power, relative power and timing are only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

6. Test 3: Not applicable.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires. If the UE transmits NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power is only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”.

8.2. The UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”.

9.3. The UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires. If the UE transmits an NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 0, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power is only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The UE shall consider this random access response reception successful and transmit the msg3.

10. Void.

6.2.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with following exceptions.

Table 6.2.16.4.3-1: RadioResourceConfigCommonSIB-NB-DEFAULT

Derivation Path: 36.508 clause 8.1.6.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-Config-v1330 ::= SEQUENCE {			
nprach-ParametersList-v1330 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330	3 entries		
NPRACH-Parameters-NB-v1330[1] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[2] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[3] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	N8		
}			
}			
}			

Table 6.2.16.4.3-2: RACH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
preambleTransMax-CE-r13	n6		
powerRampingParameters-r13 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-112		
}			
rach-InfoList-r13 (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13 {	3 entries		
RACH-Info-NB-r13[1] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[2] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[3] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
}			
powerRampingParameters-v1450	Not present		
}			

Table 6.2.16.4.3-3: NPRACH-ConfigSIB-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-5			
Information Element	**Value/remark**	**Comment**	**Condition**
NPRACH-ConfigSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-CP-Length-r13	us66dot7		
rsrp-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range {	2 entries		
RSRP-Range[1]	25	-116dBm	Normal
RSRP-Range[2]	39	-102dBm	
RSRP-Range[1]	25	-116dBm	Extreme
RSRP-Range[2]	36	-105dBm	
}			
nprach-ParametersList-r13 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13 {	3 entries		
NPRACH-Parameters-NB-r13[1] ::= SEQUENCE {			
nprach-Periodicity-r13	ms40		
nprach-StartTime-r13	ms8		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n3		
numRepetitionsPerPreambleAttempt-r13	n2		
npdcch-NumRepetitions-RA-r13	r4		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[2] ::= SEQUENCE {			
nprach-Periodicity-r13	ms240		
nprach-StartTime-r13	ms64		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n6		
numRepetitionsPerPreambleAttempt-r13	n8		
npdcch-NumRepetitions-RA-r13	r16		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[3] ::= SEQUENCE {			
nprach-Periodicity-r13	ms1280		
nprach-StartTime-r13	ms512		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n10		
numRepetitionsPerPreambleAttempt-r13	n64		
npdcch-NumRepetitions-RA-r13	r128		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
}			
}			

Table 6.2.16.4.3-4: NPDSCH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-4			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDSCH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
nrs-Power-r13	-5 (dBm)		
}			

6.2.16.5 Test requirement

Tables 6.2.16.5-1 and 6.2.16.5-2 define the primary level settings for HD-FDD contention based random access test. Table 6.2.16.5-3 defines the NPRACH configuration parameters. Tables 6.2.16.5-4 and 6.2.16.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.1.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.16.5-1: Ncell specific test parameters for HD-FDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
PRB location within eCell	-	eCell1 $BW_{channel}$ 5MHz: 17 eCell1 $BW_{channel}$ 10MHz: 30	
NPDSCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.17 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.15 HD-FDD	As defined in A.10.2.1
NPDCCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.39 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.27 HD-FDD	As defined in A.10.1.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table 6.2.16.5-2	
$\hat{E}_s / N_{oc}$	dB	3.1	
$\hat{E}_s / I_{ot}$ Note 3	dB	3.1	
NRSRP Note 3	dBm/15 kHz	-94.90	
Io Note 3	dBm/180kHz	-82.38	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.16.5-2: E-UTRA Cell specific test parameters for HD-FDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern Note 1 As specified in D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.16.5-3: NPRACH-Configuration parameters for HD-FDD c8ontention based random access test for UE category NB1 In-Band mode in Normal Coverage

Field	Value			Comment
Parameters not per NPRACH resource				
RSRP-ThresholdsNPRACH-InfoList	{40, 54}			Normal condition: Corresponding to {-116, -102} dBm as defined in TS 36.331 Section 9.1.22.9
	{40, 51}			Extreme condition: Corresponding to {-116, -105} dBm as defined in TS 36.331 Section 9.1.22.9
nprach-CP-Length	us66dot7			
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-112			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-Periodicity	ms40	ms240	ms1280	
nprach-StartTime	ms8	ms64	ms512	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v1dot5	v1dot5	v1dot5	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp2	pp2	pp2	
Note 1: See Clause 6.7.3 in TS 36.331 for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preambles shall be -25 dBm to within the accuracy specified in Table 6.2.16.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.16.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.16.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preambles shall be -25 dBm to within the accuracy specified in Table 6.2.16.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.16.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.16.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 0 selection events “CE selection” observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.16.5-4: Absolute power tolerance for HD-FDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	± 10.4 dB
Extreme	±13.4 dB

Table 6.2.16.5-5: Relative power tolerance for HD-FDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.16.5-6: Test requirements for T_e Timing Error Limit for HD-FDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.2.17 Contention Based Random Access Test for UE category NB1 UEs In-band mode in Enhanced Coverage

6.2.17.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Enhanced Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.17.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

6.2.17.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 6.2.16.3.

6.2.17.4 Test description

6.2.17.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 6.2.17.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.51 using only main Tx/Rx antenna and without fading.

2. Propagation conditions are set according to Annex B clause B.0.

3. There are one NB-IoT carrier and one E-UTRA FDD carrier and two cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.17.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with one Cell and one NB-IoT carrier with 1 Ncell.

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 in Ncell 1.

2. Set the parameters according to Tables 6.2.17.5-1 to 6.2.17.5-3 selecting values appropriate to the test condition of normal or extreme. Propagation conditions are set according to Annex B clause B.1.1.

3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response reception

   4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preamble transmission attempts (the preamble is transmitted 8 times in each attempt), the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preamble transmission attempts have been received by the SS.

4.4. The UE shall consider this random access response reception successful and transmit the msg3.

4.5. Measure the power and timing of the first preamble transmission attempt. The power of the first preamble transmission attempt shall be 23dBm for Power Class 3, 20dBm for Power Class 5 and 14dBm for Power Class 6 with the accuracy specified in Table 6.2.17.5-4. Measure the relative power and timing applied to additional preamble transmission attempts. The relative power of the last 4 preamble transmission attempts shall not exceed the values specified in Tables 6.2.17.5-5. The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.17.5-6. If the UE transmits or re- transmits NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power, relative power and timing are only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

5. Test 2: Correct behaviour when not receiving random access response reception

5.1. Repeat step 1-3.

5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preamble transmission attempts (the preamble is transmitted 8 times in each attempt).

5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 48 sub-frames.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preamble transmission attempts have been received by the SS.

5.5. The UE shall consider this random access response reception successful and transmit the msg3.

5.6. Measure the power and timing of the first preamble transmission attempt. The power of the first preamble transmission attempt shall be 23dBm for Power Class 3, 20dBm for Power Class 5 and 14dBm for Power Class 6 with the accuracy specified in Tables 6.2.17.5-4. Measure the relative power and timing applied to additional preamble transmission attempts. The relative power of the last 4 preamble transmission attempts shall not exceed the values specified in Tables 6.2.17.5-5. The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.17.5-6. If the UE transmits or re- transmits NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power, relative power and timing are only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

6. Test 3: Not applicable.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires. If the UE transmits an NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage

enhancement level 1, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power is only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

   8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”.

   8.2. The UE shall consider this random access response reception successful and transmit the msg3.

   8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

   8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

   9.1. Repeat step 1-3.

   9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS. If the UE transmits an NPRACH preamble using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”.

   9.3. The UE shall consider this random access response reception successful and transmit the msg3.

   9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

   9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires. If the UE transmits an NPRACH preambles using the NPRACH resources and NPRACH configuration corresponding to the coverage enhancement level 1, then for each preamble count a success for the event “CE selection”. Otherwise count a fail for the event “CE selection”. The power is only measured if the coverage enhancement level selection was correct, and any results relating to a wrong selection are discarded.

   9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   9.7. The UE shall consider this random access response reception successful and transmit the msg3.

10. Void.

6.2.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with following exceptions.

Table 6.2.17.4.3-1: RadioResourceConfigCommonSIB-NB-DEFAULT

Derivation Path: 36.508 clause 8.1.6.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-Config-v1330 ::= SEQUENCE {			
nprach-ParametersList-v1330 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330	3 entries		
NPRACH-Parameters-NB-v1330[1] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[2] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[3] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
}			
}			

Table 6.2.17.4.3-2: RACH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
preambleTransMax-CE-r13	n6		
powerRampingParameters-r13 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
rach-InfoList-r13 (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13 {	3 entries		
RACH-Info-NB-r13[1] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[2] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[3] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
}			
powerRampingParameters-v1450	Not present		
}			

Table 6.2.17.4.3-3: NPRACH-ConfigSIB-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-5			
Information Element	**Value/remark**	**Comment**	**Condition**
NPRACH-ConfigSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-CP-Length-r13	us266dot7		
rsrp-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range {	2 entries		
RSRP-Range[1]	34	-122dBm	Normal
RSRP-Range[2]	57	-99dBm	
RSRP-Range[1]	31	-125dBm	Extreme
RSRP-Range[2]	60	-96dBm	
}			
nprach-ParametersList-r13 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13 {	3 entries		
NPRACH-Parameters-NB-r13[1] ::= SEQUENCE {			
nprach-Periodicity-r13	ms40		
nprach-StartTime-r13	ms8		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n3		
numRepetitionsPerPreambleAttempt-r13	n2		
npdcch-NumRepetitions-RA-r13	r4		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[2] ::= SEQUENCE {			
nprach-Periodicity-r13	ms240		
nprach-StartTime-r13	ms64		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n6		
numRepetitionsPerPreambleAttempt-r13	n8		
npdcch-NumRepetitions-RA-r13	r16		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[3] ::= SEQUENCE {			
nprach-Periodicity-r13	ms1280		
nprach-StartTime-r13	ms512		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n10		
numRepetitionsPerPreambleAttempt-r13	n64		
npdcch-NumRepetitions-RA-r13	r128		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
}			
}			

Table 6.2.17.4.3-4: NPDSCH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-4			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDSCH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
nrs-Power-r13	-5 (dBm)		
}			

6.2.17.5 Test requirement

Tables 6.2.17.5-1 and 6.2.17.5-2 define the primary level settings for HD-FDD contention based random access test. Table 6.2.17.5-3 defines the NPRACH configuration parameters. Tables 6.2.17.5-4 and 6.2.17.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.1.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.17.5-1: Ncell specific test parameters for HD-FDD contention based random access test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
PRB location within eCell	-	eCell1 $BW_{channel}$ 5MHz: 17 eCell1 $BW_{channel}$ 10MHz: 30	
NPDSCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.17 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.15 HD-FDD	As defined in A.10.2.1
NPDCCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.39 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.27 HD-FDD	As defined in A.10.1.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table 6.2.17.5-2	
$\hat{E}_s / N_{oc}$	dB	-12.5	
$\hat{E}_s / I_{ot}$ Note 3	dB	-12.5	
NRSRP Note 3	dBm/15 kHz	-110.5	
Io Note 3	dBm/180kHz	-86.97	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.17.5-2: E-UTRA Cell specific test parameters for HD-FDD contention based random access test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern Note 1 As specified in D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.17.5-3: NPRACH-Configuration parameters for HD-FDD contention based random access test for UE category NB1 In-Band mode in Enhanced Coverage

Field	Value			Comment
Parameters not per NPRACH resource				
RSRP-ThresholdsNPRACH-InfoList	{34, 57}			Normal condition: Corresponding to {-122, -99} dBm as defined in TS 36.133 Section 9.1.22.9
	{31, 60}			Extreme condition: Corresponding to {-125, -96} dBm as defined in TS 36.133 Section 9.1.22.9]
nprach-CP-Length	Us266dot7			
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, 20 dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-Periodicity	ms40	ms240	ms1280	
nprach-StartTime	ms8	ms64	ms512	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v1dot5	v1dot5	v1dot5	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp2	pp2	pp2	
Note 1: See Clause 6.7.3 in TS 36.331 for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.17.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.17.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.17.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preamble shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.17.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.17.5-5.

- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.17.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 1 selection events “CE selection” observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.17.5-4: Absolute power tolerance for HD-FDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	± 14.3 dB
Extreme	±17.3 dB

Table 6.2.17.5-5: Relative power tolerance for HD-FDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.17.5-6: Test requirements for T_e Timing Error Limit for HD-FDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.2.18 Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage

6.2.18.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Enhanced Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.18.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 14 and forward of UE Category NB1 supporting multi-carrier operation.

6.2.18.3 Minimum conformance requirements

Same as minimum conformance requirements defined in 6.2.17.3.

6.2.18.4 Test description

6.2.18.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 6.2.18.5-1 and 6.2.18.5-2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.52a using only main Tx/Rx antenna and without fading.
2. Propagation conditions are set according to Annex B clause B.0.
3. There are one NB-IoT cell and one LTE cell specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. In Ncell 1 one anchor carrier and one non-anchor carrier are configured.

6.2.18.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with one Cell and 2 NB-IoT carriers with 1 Ncell.

The test procedures are the same as test procedures defined in 6.2.17.4.2, with step 4 and forward performed on the non-anchor carrier.

6.2.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with following exceptions.

Table 6.2.18.4.3-1: *SystemInformationBlockType22-NB*

Derivation Path: 36.508 Table 8.1.4.3.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType22-NB-r14 ::= SEQUENCE {			
ul-ConfigList-r14 SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF UL-ConfigCommon-NB-r14 SEQUENCE {			
UL-ConfigCommon-NB-r14[1] SEQUENCE {			
nprach-ParametersList-r14 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r14 SEQUENCE {			
NPRACH-Parameters-NB-r14[1] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms40		
nprach-StartTime-r14	ms8		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	zero		
npdcch-NumRepetitions-RA-r14	r4		
npdcch-StartSF-CSS-RA-r14	v1dot5		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n8		
npdcch-CarrierIndex-r14	1		
}			
}			
NPRACH-Parameters-NB-r14[2] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms240		
nprach-StartTime-r14	ms64		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	zero		
npdcch-NumRepetitions-RA-r14	r16		
npdcch-StartSF-CSS-RA-r14	v1dot5		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n20		
npdcch-CarrierIndex-r14	1		
}			
}			
NPRACH-Parameters-NB-r14[3] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms1280		
nprach-StartTime-r14	ms512		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	zero		
npdcch-NumRepetitions-RA-r14	r128		
npdcch-StartSF-CSS-RA-r14	v1dot5		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n40		
npdcch-CarrierIndex-r14	1		
}			
}			
}			
}			
}			
nprach-ProbabilityAnchorList-r14 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-ProbabilityAnchor-NB-r14 SEQUENCE {			
NPRACH-ProbabilityAnchor-NB-r14[1] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		
}			
NPRACH-ProbabilityAnchor-NB-r14[2] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		

}			
NPRACH-ProbabilityAnchor-NB-r14[3] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		
}			
}			
lateNonCriticalExtension	Not present		
}			

Table 6.2.18.4.3-2: RadioResourceConfigCommonSIB-NB-DEFAULT

Derivation Path: 36.508 clause 8.1.6.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-Config-v1330 ::= SEQUENCE {			
nprach-ParametersList-v1330 ::=SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330	3 entries		
NPRACH-Parameters-NB-v1330[1] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[2] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[3] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
}			
}			

Table 6.2.18.4.3-3: RACH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
preambleTransMax-CE-r13	n6		
powerRampingParameters-r13 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
rach-InfoList-r13 (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13 {	3 entries		
RACH-Info-NB-r13[1] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[2] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[3] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
}			
powerRampingParameters-v1450	Not present		
}			

Table 6.2.18.4.3-4: NPRACH-ConfigSIB-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-5			
Information Element	**Value/remark**	**Comment**	**Condition**
NPRACH-ConfigSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-CP-Length-r13	us266dot7		
rsrp-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range {	2 entries		
RSRP-Range[1]	34	-122dBm	Normal
RSRP-Range[2]	57	-99dBm	
RSRP-Range[1]	31	-125dBm	Extreme
RSRP-Range[2]	60	-96dBm	
}			
nprach-ParametersList-r13 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13 {	3 entries		
NPRACH-Parameters-NB-r13[1] ::= SEQUENCE {			
nprach-Periodicity-r13	ms40		
nprach-StartTime-r13	ms8		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n3		
numRepetitionsPerPreambleAttempt-r13	n2		
npdcch-NumRepetitions-RA-r13	r4		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[2] ::= SEQUENCE {			
nprach-Periodicity-r13	ms240		
nprach-StartTime-r13	ms64		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n6		
numRepetitionsPerPreambleAttempt-r13	n8		
npdcch-NumRepetitions-RA-r13	r16		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[3] ::= SEQUENCE {			
nprach-Periodicity-r13	ms1280		
nprach-StartTime-r13	ms512		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n10		
numRepetitionsPerPreambleAttempt-r13	n64		
npdcch-NumRepetitions-RA-r13	r128		
npdcch-StartSF-CSS-RA-r13	v1dot5		
npdcch-Offset-RA-r13	zero		
}			
}			
}			

Table 6.2.18.4.3-5: NPDSCH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-4			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDSCH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
nrs-Power-r13	-5 (dBm)		
}			

6.2.18.5 Test requirement

Tables 6.2.18.5-1 and 6.2.18.5-2 define the primary level settings for HD-FDD contention based random access test. Table 6.2.18.5-3 defines the NPRACH configuration parameters. Tables 6.2.18.5-4 and 6.2.18.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.18.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.18.5-1: Ncell specific test parameters for HD-FDD contention based random access on non-achor carrier test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
Anchor PRB location within eCell	-	eCell1 $BW_{channel}$ 5MHz: 17 eCell1 $BW_{channel}$ 10MHz: 30	
Non-anchor PRB location within eCell		eCell1 $BW_{channel}$ 5MHz: 18 eCell1 $BW_{channel}$ 10MHz: 31	
NPDSCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.17 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.15 HD-FDD	As defined in A.10.2.1
NPDCCH parameters Note 2		eCell1 $BW_{channel}$ 5MHz: R.39 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.27 HD-FDD	As defined in A.10.1.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table 6.2.18.5-2	
$\hat{E}_s / N_{oc}$	dB	-12.5	
$\hat{E}_s / I_{ot}$ Note 3	dB	-12.5	
NRSRP Note 3	dBm/15 kHz	-110.5	
Io Note 3	dBm/180kHz	-86.97	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.18.5-2: E-UTRA Cell specific test parameters for HD-FDD contention based random access on non-achor carrier test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern Note 1 As specified in D.3	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.18.5-3: NPRACH-Configuration parameters for HD-FDD contention based random access on non-achor carrier test for UE category NB1 In-Band mode in Enhanced Coverage

Field	Value	Comment
Parameters not per NPRACH resource		
RSRP-ThresholdsNPRACH-InfoList	{34, 57}	Normal condition: Corresponding to {-122, -99} dBm as defined in TS 36.133 Section 9.1.22.9
	{31, 60}	Extreme condition: Corresponding to {-125, -96} dBm as defined in TS 36.133 Section 9.1.22.9]

nprach-CP-Length	us266dot7			
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, 20 dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-ProbabilityAnchor	zero	zero	zero	
nprach-Periodicity	ms40	ms240	ms1280	
nprach-StartTime	ms8	ms64	ms512	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v1dot5	v1dot5	v1dot5	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp2	pp2	pp2	
Note 1: See Clause 6.7.3 in TS 36.331 for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preambles shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.18.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.18.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.18.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preambles shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.18.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.18.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.18.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 0 selection events "CE selection" observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.18.5-4: Absolute power tolerance for HD-FDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	±14.3 dB
Extreme	±17.3 dB

Table 6.2.18.5-5: Relative power tolerance for HD-FDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.18.5-6: Test requirements for T_e Timing Error Limit for HD-FDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.2.19 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage

6.2.19.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Normal Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.19.2 Test applicability

This test applies to all types of NB-IoT TDD UE release 15 and forward of UE Category NB1 and higher.

6.2.19.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and NB-IoT. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. The UE category NB1 supports only contention-based random access transmission on anchor carrier and on non-anchor carrier..

The requirements in this section are applicable for the random access transmission by the UE category NB1 to an anchor carrier or to a non-anchor carrier under the following conditions:

- The anchor and non-anchor carrier frequencies are within 20 MHz and
- The anchor and the non-anchor carrier frequencies are in the same base station or in co-located base stations.

The UE shall have capability to calculate NPRACH transmission power according to the NPRACH power formula defined in TS 36.213[8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in TS 36.101[2]. The relative power applied to additional preambles shall have an accuracy as specified in 36.101[2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on target cell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321[11].

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [17] using the NPRACH configuration contained in *NPRACH-ConfigSIB-NB* in TS 36.331 [2].

The UE shall apply the following procedure:

- Determines the enhanced coverage level based on the NRSRP intra-frequency measurement performed on the anchor carrier, for NPRACH transmission to the anchor carrier or for NPRACH transmission to the non-anchor carrier, and the configured criterion as defined in section 5.1.1, TS 36,321 [17],
- Selects NPRACH resources [2] configured for the corresponding enhanced coverage level as determined in the previous step and;

- Transmits or re-transmits NPRACH preamble using the selected NPRACH resources and NPRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.6.2 and A.6.2.19.

6.2.19.4 Test description

6.2.19.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 6.2.19.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.51 using only main Tx/Rx antenna and without fading.
2. Propagation conditions are set according to Annex B clause B.0.
3. There are one NB-IoT carrier and one E-UTRA TDD carrier and two cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.19.4.2 Test procedure

Same test procedure as in clause 6.2.16.4.2 with the following exceptions:

- Instead of Table 6.2.16.5-1 → use Table 6.2.19.5-1.

6.2.19.4.3 Message contents

Same message contents as in clause 6.2.16.4.3.

6.2.19.5 Test requirement

Tables 6.2.19.5-1 and 6.2.19.5-2 define the primary level settings for TDD contention based random access test. Table 6.2.19.5-3 defines the NPRACH configuration parameters. Tables 6.2.19.5-4 and 6.2.19.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.19.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.19.5-1: nCell specific test parameters for TDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
PRB location within eCell	-	eCell1 $BW_{channel}$ 10MHz: 30	
NPDSCH parameters Note 2		R.15 NB-TDD	Specified in section A.3.1.5.7
NPDCCH parameters Note 2		R.27 NB-TDD	Specified in section A.3.1.6.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table A.6.2.19.1-2	
$\hat{E}_s / N_{oc}$	dB	3	
$\hat{E}_s / I_{ot}$ Note 3	dB	3	
NRSRP Note 3	dBm/15 kHz	-95	
Io Note 3	dBm/180 KHz	-82.45	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.19.5-2: eCell specific test parameters for TDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	10
NOCNG Pattern Note 1	-	NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.19.5-3: NPRACH-Configuration parameters for TDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Field	Value			Comment
Parameters not per NPRACH resource				
RSRP-ThresholdsNPRACH-InfoList	{40, 55}			Corresponding to {-116, -101} dBm as defined in Section 9.1.22.9
nprach-PreambleFormat	fmt-0			See TS 36.211 section 10.1.6
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, 20 dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-112			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-Periodicity	ms80	ms640	ms5120	
nprach-StartTime	ms10	ms80	ms640	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v4	v4	v4	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp8	pp8	pp8	
Note 1: See Clause 6.7.3 in TS 36.331 [2] for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preambles shall be -25 dBm to within the accuracy specified in Table 6.2.19.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.19.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.19.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preambles shall be -25 dBm to within the accuracy specified in Table 6.2.19.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.19.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.19.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 0 selection events “CE selection” observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.19.5-4: Absolute power tolerance for TDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	± 10.4 dB
Extreme	±13.4 dB

Table 6.2.19.5-5: Relative power tolerance for TDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.19.5-6: Test requirements for T_e Timing Error Limit for TDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.2.20 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in enhanced coverage

6.2.20.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Enhanced Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.20.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2.

6.2.20.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 6.2.19.3.

6.2.20.4 Test description

6.2.20.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 6.2.20.5-1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.51 using only main Tx/Rx antenna and without fading.
2. Propagation conditions are set according to Annex B clause B.0.
3. There are one NB-IoT carrier and one E-UTRA TDD carrier and two cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.20.4.2 Test procedure

Same test procedure as in clause 6.2.17.4.2 with the following exceptions:

- Instead of Table 6.2.17.5-1 → use Table 6.2.20.5-1.

6.2.20.4.3 Message contents

Same message contents as in clause 6.2.17.4.3.

6.2.20.5 Test requirement

Tables 6.2.20.5-1 and 6.2.20.5-2 define the primary level settings for TDD contention based random access test. Table 6.2.20.5-3 defines the NPRACH configuration parameters. Tables 6.2.20.5-4 and 6.2.20.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.20.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.20.5-1: nCell specific test parameters for TDD contention based random access test for UE category NB1 In-Band mode in Enhanced coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
PRB location within eCell	-	eCell1 $BW_{channel}$ 10MHz: 30	
NPDSCH parameters Note 2		R.15 NB-TDD	Specified in section A.3.1.5.7
NPDCCH parameters Note 2		R.27 NB-TDD	Specified in section A.3.1.6.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table A.6.2.20.1-2	
$\hat{E}_s / N_{oc}$	dB	-12.5	
$\hat{E}_s / I_{ot}$ Note 3	dB	-12.5	
NRSRP Note 3	dBm/15 kHz	-110.5	
Io Note 3	dBm/180 KHz	-86.97	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.20.5-2: eCell specific test parameters for TDD contention based random access test for UE category NB1 In-Band mode in Enhanced coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	10
NOCNG Pattern Note 1	-	NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.20.5-3: NPRACH-Configuration parameters for TDD contention based random access test for UE category NB1 In-Band mode in Normal Coverage

Field	Value			Comment
Parameters not per NPRACH resource				
RSRP-ThresholdsNPRACH-InfoList	{35, 56}			Corresponding to {-116, -101} dBm as defined in Section 9.1.22.9
nprach-PreambleFormat	fmt-0			See TS 36.211 section 10.1.6
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, 20 dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-Periodicity	ms80	ms640	ms5120	
nprach-StartTime	ms10	ms80	ms640	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v4	v4	v4	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp8	pp8	pp8	
Note 1: See Clause 6.7.3 in TS 36.331 [2] for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.20.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.20.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.20.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preamble shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.20.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.20.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.20.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 1 selection events “CE selection” observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.20.5-4: Absolute power tolerance for HD-FDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	± 14.3 dB
Extreme	±17.3 dB

Table 6.2.20.5-5: Relative power tolerance for HD-FDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.20.5-6: Test requirements for T_e Timing Error Limit for HD-FDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.2.21 TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage

6.2.21.1 Test purpose

To verify whether the behaviour of the random access procedure of a category NB1 UE in Enhanced Coverage is according to the requirements, whether the NPRACH power settings and timing are within specified limits, and whether

the UE determines properly the enhanced coverage level based on the NRSRP measurement and the configured criterion in NRSRP-ThresholdsPrach. This test will verify the requirements in TS 36.133 Clause 6.6.2, Clause 6.6.3 and Clause 7.20.2 in an AWGN model.

6.2.21.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2.

6.2.21.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 6.2.17.3.

6.2.21.4 Test description

6.2.21.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 6.2.21.5-1 and 6.2.21.5-2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.52a using only main Tx/Rx antenna and without fading.
2. Propagation conditions are set according to Annex B clause B.0.
3. There are one NB-IoT cell and one LTE cell specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. In Ncell 1 one anchor carrier and one non-anchor carrier are configured.

6.2.21.4.2 Test procedure

Same test procedure as in clause 6.2.18.4.2.

6.2.21.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with following exceptions.

Table 6.2.21.4.3-1: *SystemInformationBlockType22-NB*

Derivation Path: 36.508 Table 8.1.4.3.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType22-NB-r14 ::= SEQUENCE {			
ul-ConfigList-r14 SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF UL-ConfigCommon-NB-r14 SEQUENCE {			
UL-ConfigCommon-NB-r14[1] SEQUENCE {			
nprach-ParametersList-r14 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r14 SEQUENCE {			
NPRACH-Parameters-NB-r14[1] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms80		
nprach-StartTime-r14	ms10		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	Zero		
npdcch-NumRepetitions-RA-r14	r4		
npdcch-StartSF-CSS-RA-r14	v4		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n8		
npdcch-CarrierIndex-r14	1		
}			
}			
NPRACH-Parameters-NB-r14[2] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms640		
nprach-StartTime-r14	ms80		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	zero		
npdcch-NumRepetitions-RA-r14	r16		
npdcch-StartSF-CSS-RA-r14	v4		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n8		
npdcch-CarrierIndex-r14	1		
}			
}			
NPRACH-Parameters-NB-r14[3] SEQUENCE {			
nprach-Parameters-r14 SEQUENCE {			
nprach-Periodicity-r14	ms5120		
nprach-StartTime-r14	ms640		
nprach-SubcarrierOffset-r14	n0		
nprach-NumSubcarriers-r14	n12		
nprach-SubcarrierMSG3-RangeStart-r14	zero		
npdcch-NumRepetitions-RA-r14	r128		
npdcch-StartSF-CSS-RA-r14	v4		
npdcch-Offset-RA-r14	zero		
nprach-NumCBRA-StartSubcarriers-r14	n8		
npdcch-CarrierIndex-r14	1		
}			
}			
}			
}			
}			
nprach-ProbabilityAnchorList-r14 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-ProbabilityAnchor-NB-r14 SEQUENCE {			
NPRACH-ProbabilityAnchor-NB-r14[1] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		
}			
NPRACH-ProbabilityAnchor-NB-r14[2] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		

}			
NPRACH-ProbabilityAnchor-NB-r14[3] SEQUENCE {			
nprach-ProbabilityAnchor-r14	zero		
}			
}			
lateNonCriticalExtension	Not present		
}			

Table 6.2.21.4.3-2: RadioResourceConfigCommonSIB-NB-DEFAULT

Derivation Path: 36.508 clause 8.1.6.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-Config-v1330 ::= SEQUENCE {			
nprach-ParametersList-v1330 ::=SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330	3 entries		
NPRACH-Parameters-NB-v1330[1] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[2] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
NPRACH-Parameters-NB-v1330[3] ::= SEQUENCE {			
nprach-NumCBRA-StartSubcarriers-r13	n8		
}			
}			
}			

Table 6.2.21.4.3-3: RACH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
preambleTransMax-CE-r13	n6		
powerRampingParameters-r13 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
rach-InfoList-r13 (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13 {	3 entries		
RACH-Info-NB-r13[1] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[2] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
RACH-Info-NB-r13[3] SEQUENCE {			
ra-ResponseWindowSize-r13	pp2		
mac-ContentionResolutionTimer-r13	pp2		
}			
}			
powerRampingParameters-v1450	Not present		
}			

Table 6.2.21.4.3-4: NPRACH-ConfigSIB-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-5			
Information Element	**Value/remark**	**Comment**	**Condition**
NPRACH-ConfigSIB-NB-DEFAULT ::= SEQUENCE {			
nprach-CP-Length-r13	us66dot7		
rsrp-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range {	2 entries		
RSRP-Range[1]	35	-116dBm	Normal
RSRP-Range[2]	56	-101dBm	
RSRP-Range[1]	32	-119dBm	Extreme
RSRP-Range[2]	59	-98dBm	
}			
nprach-ParametersList-r13 SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13 {	3 entries		
NPRACH-Parameters-NB-r13[1] ::= SEQUENCE {			
nprach-Periodicity-r13	ms80		
nprach-StartTime-r13	ms10		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n3		
numRepetitionsPerPreambleAttempt-r13	n2		
npdcch-NumRepetitions-RA-r13	r4		
npdcch-StartSF-CSS-RA-r13	v4		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[2] ::= SEQUENCE {			
nprach-Periodicity-r13	ms640		
nprach-StartTime-r13	ms80		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n6		
numRepetitionsPerPreambleAttempt-r13	n8		
npdcch-NumRepetitions-RA-r13	r16		
npdcch-StartSF-CSS-RA-r13	v4		
npdcch-Offset-RA-r13	zero		
}			
NPRACH-Parameters-NB-r13[3] ::= SEQUENCE {			
nprach-Periodicity-r13	ms5120		
nprach-StartTime-r13	ms640		
nprach-SubcarrierOffset-r13	n0		
nprach-NumSubcarriers-r13	n12		
nprach-SubcarrierMSG3-RangeStart-r13	zero		
maxNumPreambleAttemptCE-r13	n10		
numRepetitionsPerPreambleAttempt-r13	n64		
npdcch-NumRepetitions-RA-r13	r128		
npdcch-StartSF-CSS-RA-r13	v4		
npdcch-Offset-RA-r13	zero		
}			
}			
}			

Table 6.2.21.4.3-5: NPDSCH-ConfigCommon-NB-DEFAULT

Derivation Path: 36.508 Table 8.1.6.3-4			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDSCH-ConfigCommon-NB-DEFAULT ::= SEQUENCE {			
nrs-Power-r13	-5 (dBm)		
}			

6.2.21.5 Test requirement

Tables 6.2.21.5-1 and 6.2.21.5-2 define the primary level settings for TDD contention based random access test. Table 6.2.21.5-3 defines the NPRACH configuration parameters. Tables 6.2.21.5-4 and 6.2.21.5-5 define the absolute and relative power control requirements including test tolerances. Table 6.2.21.5-6 defines the uplink timing error limit including test tolerances.

Table 6.2.21.5-1: nCell specific test parameters for TDD contention based random access on non-anchor test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value	Comments
NB-IOT operational mode		In-band	
$BW_{channel}$	kHz	200	
PRB location within eCell	-	eCell1 $BW_{channel}$ 10MHz: 30	
NPDSCH parameters Note 2		R.15 NB-TDD	Specified in section A.3.1.5.7
NPDCCH parameters Note 2		R.27 NB-TDD	Specified in section A.3.1.6.1
NPBCH_RA	dB	-3	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note 1	dB		
NOCNG_RB Note 1	dB		
DRX		OFF	
N_{oc}	dBm/15 kHz	Specified in Table A.6.2.21.1-2	
$\hat{E}_s / N_{oc}$	dB	-12.5	
$\hat{E}_s / I_{ot}$ Note 3	dB	-12.5	
NRSRP Note 3	dBm/15 kHz	-110.5	
Io Note 3	dBm/180 KHz	-86.97	
Propagation Condition	-	AWGN	
Antenna Configuration		2x1	

Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.21.5-2: eCell specific test parameters for TDD contention based random access on non-anchor test for UE category NB1 In-Band mode in Enhanced Coverage

Parameter	Unit	Value
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	10
NOCNG Pattern Note 1	-	NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	3
Propagation Condition	-	AWGN
Antenna Configuration	-	2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 6.2.21.5-3: NPRACH-Configuration parameters for TDD contention based random access on non-anchor test for UE category NB1 In-Band mode in Enhanced Coverage

Field	Value	Comment
Parameters not per NPRACH resource		
RSRP-ThresholdsNPRACH-InfoList	{35, 56}	Normal condition: Corresponding to {-116, -101} dBm as defined in Section 9.1.22.9
	{32, 59}	Extreme condition: Corresponding to {-119, -98} dBm as defined in Section 9.1.22.9

nprach-PreambleFormat	fmt-0			See TS 36.211 section 10.1.6
nrs-Power	-5 dBm/15 kHz			As defined in clause 6.7.3 in TS 36.331.
Backoff Parameter Index	1			As defined in table 7.2-2 in TS 36.321
Configured UE transmitted power (P_{CMAX})	23 dBm for power class 3, 20 dBm for power class 5, 14 dBm for power class 6			As defined in clause 6.2.5F in TS 36.101
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax-CE	n6			
Parameters per NPRACH Resource				
NPRACH Resource	***Level 0***	***Level 1***	***Level 2***	
nprach-Periodicity	ms80	ms640	ms5120	
nprach-StartTime	ms10	ms80	ms640	
nprach-SubcarrierOffset	n0	n0	n0	
nprach-NumSubcarriers	n12	n12	n12	
nprach-SubcarrierMSG3-RangeStart	zero	zero	zero	
maxNumPreambleAttemptCE	n3	n6	n10	
numRepetitionsPerPreambleAttempt	n2	n8	n64	
npdcch-NumRepetitions-RA	r4	r16	r128	
npdcch-StartSF-CSS-RA	v4	v4	v4	
npdcch-Offset-RA	zero	zero	Zero	
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	
ra-ResponseWindowSize (per NPRACH Resource)	pp2	pp2	pp2	
mac-ContentionResolutionTimer (per NPRACH Resource)	pp8	pp8	pp8	
Note 1: See Clause 6.7.3 in TS 36.331 [2] for further information on the parameters in this table.				

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preambles shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.21.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.21.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.21.5-6.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preambles shall be 23 dBm for power class 3, 20 dBm for power class 5 and 14 dBm for power class 6 to within the accuracy specified in Table 6.2.21.5-4.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.21.5-5.
- The transmit timing of all NPRACH transmissions shall be within the accuracy specified in Table 6.2.21.5-6.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated NPRACH transmission power when the back off time expires if the contention resolution timer expires.

Correct behaviour when UE selects NPRACH resources

- The rate of correct coverage enhancement level 0 selection events “CE selection” observed during repeated tests shall be at least 90% with a confidence level of 95%.

Decide the test pass, if all the power, relative power and timing measurements pass and the CE selection events pass, otherwise fail the UE.

Table 6.2.21.5-4: Absolute power tolerance for TDD contention based random access test for UE category NB1

Conditions	Tolerance
Normal	±14.3 dB
Extreme	±17.3 dB

Table 6.2.21.5-5: Relative power tolerance for TDD contention based random access test for UE category NB1

Power step ΔP [dB]	NPRACH [dB]
ΔP = 0	±2.2
ΔP = 2	±2.7
ΔP = 4	±4.2
ΔP = 6	±4.7
NOTE: For extreme conditions an additional ± 2.0 dB relaxation is allowed.	

Table 6.2.21.5-6: Test requirements for T_e Timing Error Limit for TDD contention based random access test for UE category NB1

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

6.3 RRC Connection Release with Redirection

6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD

6.3.1.1 Test purpose

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

6.3.1.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.1.

6.3.1.4 Test description

6.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 6.3.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.1.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.1.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	≤5	
T2	s	1	

6.3.1.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.1.5-1 and 6.3.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.1.5-1 for Cell 1, and Table 6.3.1.5-2 for Cell 2.
6. If the UE transmits the PRACH to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.1.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-FDD-r9	CellInfoListUTRA-FDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.1.4.3-2: *CellInfoListUTRA-FDD-r9*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-FDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.1.5 Test requirement

Tables 6.3.1.4.1-1, 6.3.1.5-1 and 6.3.1.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN FDD test.

Table 6.3.1.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.1.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay}$ + $T_{identify\text{-}UTRA\ FDD}$ + $T_{SI\text{-}UTRA\ FDD}$ + T_{RA}

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.1_2 Redirection from E-UTRAN FDD to UTRAN FDD for UE Category 1bis

6.3.1_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support UTRA FDD.

6.3.1_2.3 Minimum conformance requirements

Same as in Clause 6.3.1.3.

6.3.1_2.4 Test description

6.3.1_2.4.1 Initial conditions

Same as in Clause 6.3.1.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.1_2.4.2 Test procedure

Same as in Clause 6.3.1.4.2.

6.3.1_2.4.3 Message contents

Same as in Clause 6.3.1.4.3.

6.3.1_2.5 Test requirement

Same as in Clause 6.3.1.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.1.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD

6.3.2.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements.

6.3.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

6.3.2.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.2.

6.3.2.4 Test description

6.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 6.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.2.4.3.

5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.2.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN TDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	≤5	
T2	s	1	

6.3.2.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.2.5-1 and 6.3.2.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.2.5-1 for Cell 1, and Table 6.3.2.5-2 for Cell 2.

6. If the UE transmits the PRACH to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.2.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN TDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-FDD-r9	CellInfoListUTRA-FDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.2.4.3-2: *CellInfoListUTRA-FDD-r9*: Additional Redirection from E-UTRAN TDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-FDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.2.5 Test requirement

Tables 6.3.2.4.1-1, 6.3.2.5-1 and 6.3.2.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN FDD test.

Table 6.3.2.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.2.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay}$ + $T_{identify\text{-}UTRA\ FDD}$ + $T_{SI\text{-}UTRA\ FDD}$ + T_{RA}

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.2_2 Redirection from E-UTRAN TDD to UTRAN FDD for UE Category 1bis

6.3.2_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target UTRAN TDD cell. This test will partly verify the RRC connection release with redirection to UTRAN TDD cell requirements in section 6.3.2.1.

6.3.2_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support UTRA FDD.

6.3.2_2.3 Minimum conformance requirements

Same as in Clause 6.3.2.3.

6.3.2_2.4 Test description

6.3.2_2.4.1 Initial conditions

Same as in Clause 6.3.2.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.2_2.4.2 Test procedure

Same as in Clause 6.3.2.4.2.

6.3.2_2.4.3 Message contents

Same as in Clause 6.3.2.4.3.

6.3.2_2.5 Test requirement

Same as in Clause 6.3.2.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.2.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided

6.3.3.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GERAN.

6.3.3.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.3.

6.3.3.4 Test description

6.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The parameter settings for the cells are set up according to Table 6.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.3.4.3.

5. There is one E-UTRA FDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.3.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	GSM cells are provided in the "*RRCConnectionRelease*" message.
T1	s	5	
T2	s	2	

6.3.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.3.5-1 and 6.3.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.3.5-1 for Cell 1, and Table 6.3.3.5-2 for Cell 2.

6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 1120 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.3.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
geran-r9	CellInfoListGERAN-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.3.4.3-2: *CellInfoListGERAN-r9*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListGERAN-r9 ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
carrierFreq-r9	Cell 2 carrier frequency		
systemInformation-r9	Cell 2 relevant system information		
}			

6.3.3.5 Test requirement

Tables 6.3.3.4.1-1, 6.3.3.5-1 and 6.3.3.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to GERAN test.

Table 6.3.3.5-1: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.3.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 0; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 1120 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.3_2 Redirection from E-UTRAN FDD to GERAN when System Information is provided for UE Category 1bis

6.3.3_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.3_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support GERAN.

6.3.3_2.3 Minimum conformance requirements

Same as in Clause 6.3.3.3.

6.3.3_2.4 Test description

6.3.3_2.4.1 Initial conditions

Same as in Clause 6.3.3.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.3.3_2.4.2 Test procedure

Same as in Clause 6.3.3.4.2.

6.3.3_2.4.3 Message contents

Same as in Clause 6.3.3.4.3.

6.3.3_2.5 Test requirement

Same as in Clause 6.3.3.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.3.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided

6.3.4.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GERAN.

6.3.4.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.4.

6.3.4.4 Test description

6.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.4.4.3.
5. There is one E-UTRA TDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.4.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	GSM cells are provided in the "*RRCConnectionRelease*" message.
T1	s	5	
T2	s	2	

6.3.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.4.5-1 and 6.3.4.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.4.5-1 for Cell 1, and Table 6.3.4.5-2 for Cell 2.
6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 1120 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.4.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN TDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
RedirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
geran-r9	CellInfoListGERAN-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.4.4.3-2: *CellInfoListGERAN-r9*: Additional Redirection from E-UTRAN TDD to GERAN test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListGERAN-r9 ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
carrierFreq-r9	Cell 2 carrier frequency		
systemInformation-r9	Cell 2 relevant system information		
}			

6.3.4.5 Test requirement

Tables 6.3.4.4.1-1, 6.3.4.5-1 and 6.3.4.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to GERAN test.

Table 6.3.4.5-1: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.4.3.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 0; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 1120 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.4_2 Redirection from E-UTRAN TDD to GERAN when System Information is provided for UE Category 1bis

6.3.4_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.4_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support GERAN.

6.3.4_2.3 Minimum conformance requirements

Same as in Clause 6.3.4.3.

6.3.4_2.4 Test description

6.3.4_2.4.1 Initial conditions

Same as in Clause 6.3.4.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.3.4_2.4.2 Test procedure

Same as in Clause 6.3.4.4.2.

6.3.4_2.4.3 Message contents

Same as in Clause 6.3.4.4.3.

6.3.4_2.5 Test requirement

Same as in Clause 6.3.4.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.4.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD

6.3.5.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD.

6.3.5.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.5.

6.3.5.4 Test description

6.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 6.3.5.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.5.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.5.4.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Uplink-downlink configuration of cell 1		1	As specified in table 4.2-2 in TS 36.211.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	5	
T2	s	1	

6.3.5.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.5.5-1 and 6.3.5.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.5.5-1for Cell 1, and Table 6.3.5.5-2 for Cell 2.

6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.5.4.3-1: *RRCConnectionRelease*: E-UTRA TDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-TDD-r9	CellInfoListUTRA-TDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.5.4.3-2: *CellInfoListUTRA-TDD-r9*: E-UTRA TDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-TDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.5.5 Test requirement

Tables 6.3.5.4.1-1, 6.3.5.5-1 and 6.3.5.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN TDD test.

Table 6.3.5.5-1: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.5.5-2: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS 36.133 [4] section 6.3.2.3.

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; which is defined in TS 36.133 [4] section 6.3.2.3.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$ = 0 ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

T_{RA} = 40ms. This is the additional delay caused by the random access procedure

It gives a total delay of 650 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.5_2 E-UTRA TDD RRC connection release redirection to UTRA TDD for UE Category 1bis

6.3.5_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.5_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support UTRA TDD.

6.3.5_2.3 Minimum conformance requirements

Same as in Clause 6.3.5.3.

6.3.5_2.4 Test description

6.3.5_2.4.1 Initial conditions

Same as in Clause 6.3.5.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.5_2.4.2 Test procedure

Same as in Clause 6.3.5.4.2.

6.3.5_2.4.3 Message contents

Same as in Clause 6.3.5.4.3.

6.3.5_2.5 Test requirement

Same as in Clause 6.3.5.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.5.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD

6.3.6.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD.

6.3.6.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.6.

6.3.6.4 Test description

6.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 6.3.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 6.3.6.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.6.4.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	5	
T2	s	1	

6.3.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.6.5-1 and 6.3.6.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.6.5-1 for Cell 1, and Table 6.3.6.5-2 for Cell 2.

6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.6.4.3-1: *RRCConnectionRelease*: E-UTRA FDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-TDD-r9	CellInfoListUTRA-TDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.6.4.3-2: *CellInfoListUTRA-TDD-r9*: E-UTRA FDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-TDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.6.5 Test requirement

Tables 6.3.6.4.1-1, 6.3.6.5-1 and 6.3.6.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN TDD test.

Table 6.3.6.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.6.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number Note1		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior Note2	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS 36.133 [4] section 6.3.2.3.

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; which is defined in TS 36.133 [4] section 6.3.2.3.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$ = 0 ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

T_{RA} = 40ms. This is the additional delay caused by the random access procedure.

This gives a total delay of 650 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.6_2 E-UTRA FDD RRC connection release redirection to UTRA TDD for UE Category 1bis

6.3.6_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.6_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support UTRA TDD.

6.3.6_2.3 Minimum conformance requirements

Same as in Clause 6.3.6.3.

6.3.6_2.4 Test description

6.3.6_2.4.1 Initial conditions

Same as in Clause 6.3.6.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.6_2.4.2 Test procedure

Same as in Clause 6.3.6.4.2.

6.3.6_2.4.3 Message contents

Same as in Clause 6.3.6.4.3.

6.3.6_2.5 Test requirement

Same as in Clause 6.3.6.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.6.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

6.3.7.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD.

6.3.7.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.7.

6.3.7.4 Test description

6.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 6.3.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.7.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.7.4.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	s	5	
T2	s	2	

6.3.7.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1. The "*RRCConnectionRelease*" message shall not contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.7.5-1 and 6.3.7.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.7.5-1for Cell 1, and Table 6.3.7.5-2 for Cell 2.

6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.7.4.3-1: *RRCConnectionRelease*: E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.7.5 Test requirement

Tables 6.3.7.4.1-1, 6.3.7.5-1 and 6.3.7.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN TDD test without SI provided.

Table 6.3.7.5-1: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.7.5-2: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number Note1		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior Note2	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms; It is the RRC procedure for processing the received message "*RRCConnectionRelease*".

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; It is the time to identify the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.7_2 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis

6.3.7_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.7_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support UTRA TDD.

6.3.7_2.3 Minimum conformance requirements

Same as in Clause 6.3.7.3.

6.3.7_2.4 Test description

6.3.7_2.4.1 Initial conditions

Same as in Clause 6.3.7.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.7_2.4.2 Test procedure

Same as in Clause 6.3.7.4.2.

6.3.7_2.4.3 Message contents

Same as in Clause 6.3.7.4.3.

6.3.7_2.5 Test requirement

Same as in Clause 6.3.7.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.7.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

6.3.8.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD.

6.3.8.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.8.

6.3.8.4 Test description

6.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 6.3.8.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.8.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.8.4.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

6.3.8.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.8.5-1 and 6.3.8.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during time period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.8.5-1 for Cell 1 and Table 6.3.8.5-2 for Cell 2.
6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.8.4.3-1: *RRCConnectionRelease*: E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.8.5 Test requirement

Tables 6.3.8.4.1-1, 6.3.8.5-1 and 6.3.8.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN TDD test.

Table 6.3.8.5-1: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.8.5-2: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms; It is the RRC procedure for processing the received message "*RRCConnectionRelease*".

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; It is the time to identify the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.8_2 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis

6.3.8_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.8_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support UTRA TDD.

6.3.8_2.3 Minimum conformance requirements

Same as in Clause 6.3.8.3.

6.3.8_2.4 Test description

6.3.8_2.4.1 Initial conditions

Same as in Clause 6.3.8.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.8_2.4.2 Test procedure

Same as in Clause 6.3.8.4.2.

6.3.8_2.4.3 Message contents

Same as in Clause 6.3.8.4.3.

6.3.8_2.5 Test requirement

Same as in Clause 6.3.8.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.8.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information

6.3.9.1 Test purpose

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell without system information. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

6.3.9.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.1.

6.3.9.4 Test description

6.3.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 6.3.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.9.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.9.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	≤5	
T2	s	2	

6.3.9.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message not containing any system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.9.5-1 and 6.3.9.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.9.5-1 for Cell 1, and Table 6.3.9.5-2 for Cell 2.
6. If the UE transmits the PRACH to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.9.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement without system information (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.9.5 Test requirement

Tables 6.3.9.4.1-1, 6.3.9.5-1 and 6.3.9.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN FDD without system information test.

Table 6.3.9.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.9.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to transmit random access to Cell 2 less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay}$ + $T_{identify\text{-}UTRA\ FDD}$ + $T_{SI\text{-}UTRA\ FDD}$ + T_{RA}

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 1280 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 1930 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.9_2 Redirection from E-UTRAN FDD to UTRAN FDD without System Information for UE Category 1bis

6.3.9_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target UTRAN FDD cell without system information. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.9_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support UTRA FDD.

6.3.9_2.3 Minimum conformance requirements

Same as in Clause 6.3.9.3.

6.3.9_2.4 Test description

6.3.9_2.4.1 Initial conditions

Same as in Clause 6.3.9.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.9_2.4.2 Test procedure

Same as in Clause 6.3.9.4.2.

6.3.9_2.4.3 Message contents

Same as in Clause 6.3.9.4.3.

6.3.9_2.5 Test requirement

Same as in Clause 6.3.9.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.9.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided

6.3.10.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GERAN.

6.3.10.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.10.

6.3.10.4 Test description

6.3.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The parameter settings for the cells are set up according to Table 6.3.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.10.4.3.
5. There is one E-UTRA FDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.10.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	Only the list of GERAN carrier frequencies is provided in the "*RRCConnectionRelease*" message.
T1	s	≤5	
T2	s	4	

6.3.10.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.10.5-1 and 6.3.10.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* without the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.10.5-1 for Cell 1, and Table 6.3.10.5-2 for Cell 2.
6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 3020 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.10.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.10.5 Test requirement

Tables 6.3.10.4.1-1, 6.3.10.5-1 and 6.3.10.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to GERAN test.

Table 6.3.10.5-1: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.10.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 1900 ms; which is the maximum time allowed to read BCCH data from the target GERAN cell.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 3020 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.10_2 Redirection from E-UTRAN FDD to GERAN when System Information is not provided for UE Category 1bis

6.3.10_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis is able to perform the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.10_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis that support GERAN.

6.3.10_2.3 Minimum conformance requirements

Same as in Clause 6.3.10.3.

6.3.10_2.4 Test description

6.3.10_2.4.1 Initial conditions

Same as in Clause 6.3.10.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.3.10_2.4.2 Test procedure

Same as in Clause 6.3.10.4.2.

6.3.10_2.4.3 Message contents

Same as in Clause 6.3.10.4.3.

6.3.10_2.5 Test requirement

Same as in Clause 6.3.10.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.10.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided

6.3.11.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.11.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GERAN.

6.3.11.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.11.

6.3.11.4 Test description

6.3.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The parameter settings for the cells are set up according to Table 6.3.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.11.4.3.
5. There is one E-UTRA TDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.11.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	Only the list of GERAN carrier frequencies is provided in the "*RRCConnectionRelease*" message.
T1	s	≤5	
T2	s	4	

6.3.11.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.11.5-1 and 6.3.11.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during time period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.11.5-1 for Cell 1 and Table 6.3.11.5-2 for Cell 2.
6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 3020 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Cell 1 is the active cell.
8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.11.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.11.5 Test requirement

Tables 6.3.11.4.1-1, 6.3.11.5-1 and 6.3.11.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to GERAN test.

Table 6.3.11.5-1: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.11.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 1900 ms; which is the maximum time allowed to read BCCH data from the target GERAN cell.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 3020 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.11_2 Redirection from E-UTRAN TDD to GERAN when System Information is not provided for UE Category 1bis

6.3.11_2.1 Test purpose

The purpose of this test is to verify that the UE of category 1bis is able to perform the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.11_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support GERAN.

6.3.11_2.3 Minimum conformance requirements

Same as in Clause 6.3.11.3.

6.3.11_2.4 Test description

6.3.11_2.4.1 Initial conditions

Same as in Clause 6.3.11.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

6.3.11_2.4.2 Test procedure

Same as in Clause 6.3.11.4.2.

6.3.11_2.4.3 Message contents

Same as in Clause 6.3.11.4.3.

6.3.11_2.5 Test requirement

Same as in Clause 6.3.11.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.11.5-1 shall be 1x1 instead of the default 1x2 configuration.

6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

6.3.12.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRAN TDD to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRAN\ FDD}$. This test will partly verify the RRC connection release with redirection to UTRAN FDD requirements.

6.3.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

6.3.12.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.12.

6.3.12.4 Test description

6.3.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 6.3.12.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.12.4.3.

5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.12.4.1-1: General test parameters for E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRAN RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRAN RF channel number 1.
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length		Normal	Applicable to cell 1
UTRAN RF Channel Number		1	One UTRAN TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRAN FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	≤5	
T2	s	2	

6.3.12.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2. The "*RRCConnectionRelease*" message not containing any system information of Cell 2 shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.12.5-1 and 6.3.12.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.12.5-1 for Cell 1, and Table 6.3.12.5-2 for Cell 2.

6. If the UE transmits the PRACH to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests are increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.12.4.3-1: *RRCConnectionRelease*: Additional E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.12.5 Test requirement

Tables 6.3.12.4.1-1, 6.3.12.5-1 and 6.3.12.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN FDD test.

Table 6.3.12.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.12.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12+TT	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to send random access to the target UTRAN FDD cell (Cell 2) less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRAN\ FDD} + T_{SI\text{-}UTRAN\ FDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS 36.133 [4] section 6.3.2.1.

$T_{identify\text{-}UTRAN\ FDD}$ = 500 ms; which is defined in TS 36.133 [4] section 6.3.2.1.

$T_{SI\text{-}UTRAN\ FDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRAN FDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.12_2 Redirection from E-UTRAN TDD to UTRAN FDD without System Information for UE Category 1bis

6.3.12_2.1 Test purpose

The purpose of this test is to verify that a UE of category 1bis correctly performs the RRC connection release with redirection to the target UTRAN TDD cell without system information. This test will partly verify the RRC connection release with redirection to UTRAN TDD cell requirements in section 6.3.2.1.

6.3.12_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis that support UTRA FDD.

6.3.12_2.3 Minimum conformance requirements

Same as in Clause 6.3.12.3.

6.3.12_2.4 Test description

6.3.12_2.4.1 Initial conditions

Same as in Clause 6.3.12.4.1 with the following exceptions:

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

6.3.12_2.4.2 Test procedure

Same as in Clause 6.3.12.4.2.

6.3.12_2.4.3 Message contents

Same as in Clause 6.3.12.4.3.

6.3.12_2.5 Test requirement

Same as in Clause 6.3.12.5 with the following exceptions:

- Antenna Configuration for the LTE cell (Cell #1) defined in Table 6.3.12.5-1 shall be 1x1 instead of the default 1x2 configuration.

7 Timing and Signalling Characteristics

The timing requirements are applicable for the uplink physical channels and signals specified in TS 36.211 [9] clause 5 (for uplink physical channels) as defined.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

7.1 UE Transmit Timing

7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy

7.1.1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.1.1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_s$.

where:

N_{TA} is $0 \leq N_{\mathrm{TA}} \leq 20512$

$N_{\mathrm{TA\_Ref}}$ is 0 for PRACH; $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. $N_{\mathrm{TA\_Ref}}(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}})$ (in T_s units) for other channels is not changed until next timing advance is received.

$N_{\mathrm{TA\ offset}}$ is 0 for frame structure type 1 as defined in TS 36.211 [9] clause 8.1.T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units T_S = 1/(15000 x 2048) seconds.

Table 7.1.1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission

timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{TA\_Ref} + N_{TA\,offset}) \times T_s$ before the downlink timing.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q.

2) The minimum aggregate adjustment rate shall be 7 * × T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-2.

Table 7.1.1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.1.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.1.4 Test description

7.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of $+128 \times T_S$ (approximately +4 μs) for 1.4MHz downlink bandwidth (Test 3) compared to that in step 5. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1.5-4, with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1.5-4 For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 1-10 for each sub-test in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate.

7.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.1.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 and bw7 for Test 3	
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and Test 3 and sc3 for Test 2	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 0 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.1.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.1.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.1.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.1.5 Test requirement

Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.1.5-4, 7.1.1.5-5 and 7.1.1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
DRX cycle	ms	OFF	80[Note5]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	R.6 FDD	R.8 FDD
OCNG Pattern[Note2]		OP.2 FDD	OP.2 FDD	OP.4 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see section A.2.1.
Note 2: For the OCNG pattern, see section D.1.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.1.5-3.

Table 7.1.1.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test 1	Test 2	Test 3	Comment
	Value			
srs-BandwidthConfig	bw5	bw5	bw7	
srs-SubframeConfig	sc1	sc3	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPts	N/A	N/A	N/A	Not applicable for FDD
srs-Bandwidth	0	0	0	No hopping
srs-HoppingBandwidth	hbw0	hbw0	hbw0	
freqDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
srs-ConfigIndex	0	77	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.1.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1 and 3, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.1.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.

3) For tests 1 and 3, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.1.5-6.

Table 7.1.1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$18*T_S$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.1.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
1.4	$18.6*T_S$
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.1.5-1.

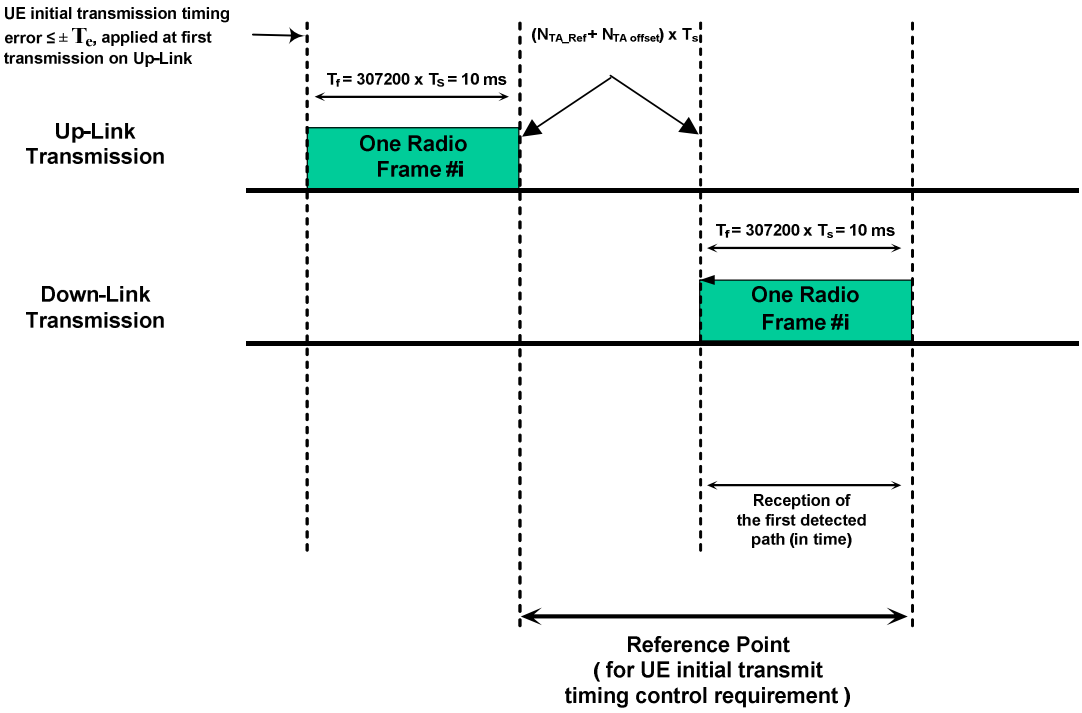

Figure 7.1.1.5-1: Illustration of measurement principle

7.1.1_1 E-UTRAN FDD - UE Transmit Timing Accuracy (Non DRx UE)

7.1.1_1.1 Test purpose

Same test purpose as in clause 7.1.1.1

7.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD release 8 UE's not supporting FGI bit 5.

7.1.1_1.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.1.3

7.1.1_1.4 Test description

7.1.1_1.4.1 Initial conditions

Same initial condition as in clause 7.1.1.4.1

7.1.1_1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 or Test 3 in Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for ≥3 MHz downlink bandwidth (Test 1) and a delay of $+128 \times T_S$ (approximately +4 μs) for 1.4MHz downlink bandwidth (Test 3) compared to that in step 5.
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.1_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1_1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.1_1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
11. Repeat step 1-10 for each sub-test in Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 as appropriate.

7.1.1_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with exceptions listed in Tables 7.1.1.4.3-1, 7.1.1.4.3-2, 7.1.1.4.3-6, and 7.1.1.4.3-7 of section 7.1.1.4.3 and the following:

Table 7.1.1_1.4.3-1: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and bw7 for Test 3	
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1_1.4.3-2: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
Duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

7.1.1_1.5 Test requirement

Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.1_1.5-3, 7.1.1_1.5-4 and 7.1.1_1.5-5 define the rules for adjustments made to the UE uplink timing including Test Tolerances.

Table 7.1.1_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	N/A	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	N/A	1.4
DRX cycle	ms	OFF	N/A	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	N/A	R.8 FDD
OCNG Pattern[Note2]		OP.2 FDD	N/A	OP.4 FDD
PBCH_RA	dB	0	N/A	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	N/A	-98
$\hat{E}_s / I_{ot}$	dB	3.30	N/A	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	N/A	3.30
Io[Note4]	dBm/9 MHz	-65.25	N/A	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	N/A	AWGN

Note 1: For the reference measurement channels, see section A.2.1.
Note 2: For the OCNG pattern, see section D.1.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.1.1_1.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test 1	Test 2	Test 3	Comment
	Value			
srs-BandwidthConfig	bw5	N/A	bw7	
srs-SubframeConfig	sc1	N/A	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	N/A	FALSE	
srsMaxUpPts	N/A	N/A	N/A	Not applicable for FDD
srs-Bandwidth	0	N/A	0	No hopping
srs-HoppingBandwidth	hbw0	N/A	hbw0	
freqDomainPosition	0	N/A	0	
Duration	TRUE	N/A	TRUE	Indefinite duration
srs-ConfigIndex	0	N/A	0	SRS periodicity of 2ms for Test 1 and Test 3, respectively.
transmissionComb	0	N/A	0	
cyclicShift	cs0	N/A	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

The UE transmit timing offset shall be within the requirements in Table 7.1.1_1.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.1_1.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.1_1.5-4.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.1_1.5-5.

Table 7.1.1_1.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$18*T_S$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.1_1.5-5: Test requirement for maximum aggregate adjustment rate per 200 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 200 ms
1.4	$18.6*T_S$
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.1.5-1 in section 7.1.1.5.

7.1.1_2 E-UTRAN FDD - UE Transmit Timing Accuracy for UE category 1bis

7.1.1_2.1 Test purpose

Same test purpose as in clause 7.1.1.1

7.1.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

7.1.1_2.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.1.3

7.1.1_2.4 Test description

7.1.1_2.4.1 Initial conditions

Same as in Clause 7.1.1.4.1 with the following exceptions:

- Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

7.1.1_2.4.2 Test procedure

Same as in Clause 7.1.1.4.2.

7.1.1_2.4.3 Message contents

Same as in Clause 7.1.1.4.3.

7.1.1_2.5 Test requirement

Same as in Clause 7.1.1.5.

7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy

7.1.2.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.1.2.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e as defined in table 7.1.2-1 of TS 36.133 [4] clause 7.1.2. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{TA} + N_{TA\,offset}) \times T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{TA\_Ref} + N_{TA\,offset}) \times T_s$.

where:

N_{TA} is $0 \le N_{TA} \le 20512$

N_{TA_Ref} is 0 for PRACH; $N_{(N_{TA\_Ref} + N_{TA\,offset})}$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. N_{TA_Ref} in T_s units) for other channels is not changed until next timing advance is received.

$N_{TA\,offset}$ is 624 for frame structure type 2 as defined in TS 36.211 [9] clause 8.1. T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units $T_S = 1/(15000 \times 2048)$ seconds.

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{TA\_Ref} + N_{TA\,offset}) \times T_s$ before the downlink timing.

All adjustments made to the UE uplink timing $(N_{TA} + N_{TA\,offset}) \times T_s$ shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q
2) The minimum aggregate adjustment rate shall be $7 \times T_S$ per second.
3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum timing error value T_e is specified in table 7.1.2.3-1 and maximum autonomous time adjustment step T_q is specified in table 7.1.2.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.2.

Table 7.1.2.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

Table 7.1.2.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.2.4 Test description

7.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.2.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.2.5-1 and 7.1.2.5-2 and 7.1.2.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is $624\times T_S$ to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of $+128\times T_S$ (approximately +4 μs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.2.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.2.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offset is $(624 \times T_S)$ to within the limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays at $624\times T_S$ to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.2.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 1-10 for each sub-test in Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 as appropriate.

7.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.2.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.2.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.2.4.3-3: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [5] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 , bw7 for Test 3	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.2.4.3-4: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1, Test3 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.2.4.4-5: MAC-MainConfig-RBC: Additional UE transmit timing for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	1		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.2.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.2.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.2.5 Test requirement

Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Tables 7.1.2.5-4, 7.1.2.5-5 and 7.1.2.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.2.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
Special subframe configuration[Note1]		6	6	6
Uplink-downlink configuration[Note2]		1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD	R.8 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD	OP.4 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note5]				
OCNG_RB[Note5]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9]
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9]
Note 3: For the reference measurement channels, see section A.2.2.
Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz).
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.2.5-3.

Table 7.1.2.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Test 3	Comment
	Value			
srsBandwidthConfiguration	bw5	bw5	bw7	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.2.5-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.2.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1 and 3, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.2.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1 and 3, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.2.5-6.

Table 7.1.2.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$18*T_S$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.2.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
1.4	$18.6*T_S$
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2.5-4.

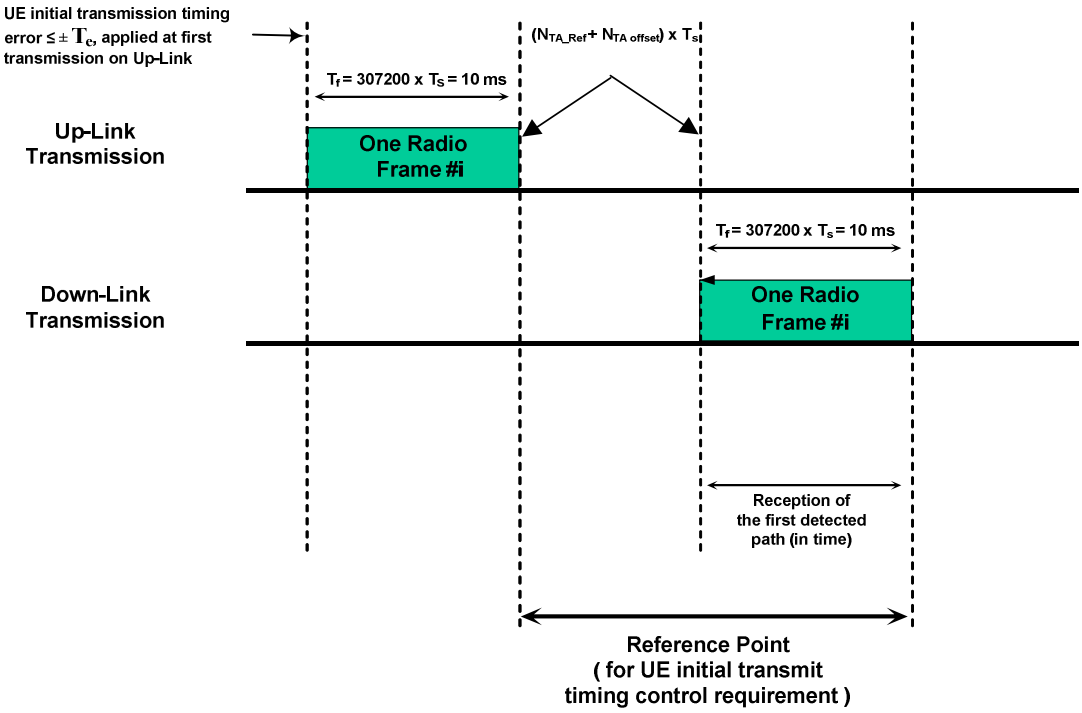

Figure 7.1.2.5-4: Illustration of measurement principle

7.1.2_1 E-UTRAN TDD - UE Transmit Timing Accuracy (Non DRx UE)

7.1.2_1.1 Test purpose

Same test purpose as 7.1.2.1

7.1.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD release 8 UE's not supporting FGI bit 5.

7.1.2_1.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.2.3

7.1.2_1.4 Test description

7.1.2_1.4.1 Initial conditions

Same initial condition as 7.1.2.4.1

7.1.2_1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 or Test 3 in Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is $624\times T_S$ to within the T_e limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for ≥3 MHz downlink bandwidth (Test 1) and a delay of $+128\times T_S$ (approximately +4 μs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5.
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.2_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.2_1.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2_1.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offset is $(624 \times T_S)$ to within the limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays at $624\times T_S$ to within the T_e limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
11. Repeat step 1-10 for each sub-test in Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 as appropriate.

7.1.2_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with exceptions listed in Tables 7.1.2.4.3-1, 7.1.2.4.3-2, 7.1.2.4.3-6, and 7.1.2.4.3-7 of section 7.1.2.4.3 and the following

Table 7.1.2_1.4.3-1: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1, bw7 for Test 3	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.2_1.4.3-2: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

7.1.2_1.5 Test requirement

Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Tables 7.1.2_1.5-3, 7.1.2_1.5-4 and 7.1.2_1.5-5 define the rules for adjustments made to the UE uplink timing including Test Tolerances.

Table 7.1.2_1.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	N/A	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	N/A	1.4
Special subframe configuration[Note1]		6	N/A	6
Uplink-downlink configuration[Note2]		1	N/A	1
DRX cycle	ms	OFF	N/A	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	N/A	R.8 TDD
OCNG Pattern[Note4]		OP.2 TDD	N/A	OP.4 TDD
PBCH_RA	dB	0	N/A	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	N/A	-98
$\hat{E}_s / I_{ot}$	dB	3.30	N/A	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	N/A	3.30
Io[Note6]	dBm/9 MHz	-65.25	N/A	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	N/A	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9]
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9]
Note 3: For the reference measurement channels, see section A.2.2.
Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz).
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.1.2_1.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Test3	Comment
	Value			
srsBandwidthConfiguration	bw5	N/A	bw7	
srsSubframeConfiguration	sc3	N/A	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	N/A	FALSE	
srsMaxUpPTS	FALSE	N/A	FALSE	
srsBandwidth	0	N/A	0	No hopping
srsHoppingBandwidth	hbw0	N/A	hbw0	
frequencyDomainPosition	0	N/A	0	
duration	TRUE	N/A	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	N/A	15	SRS periodicity of 10 ms for Test 1 and Test 3, respectively.
transmissionComb	0	N/A	0	
cyclicShift	cs0	N/A	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

The UE transmit timing offset shall be within the requirements in Table 7.1.2_1.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2_1.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.2_1.5-4.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.2_1.5-5.

Table 7.1.2_1.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$18*T_S$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.2_1.5-5: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
1.4	$18.6*T_S$
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2.5-4 in section 7.1.2.5.

7.1.2_2 E-UTRAN TDD - UE Transmit Timing Accuracy for UE category 1bis

7.1.2_2.1 Test purpose

Same test purpose as in clause 7.1.2.1

7.1.2_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

7.1.2_2.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.2.3

7.1.2_2.4 Test description

7.1.2_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.2_2.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.2_2.5-1 and 7.1.2_2.5-2 and 7.1.2_2.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is $624\times T_S$ to within the T_e limits specified in Table 7.1.2_2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of $+128\times T_S$ (approximately +4 μs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.2_2.5. To check that the minimum adjustment rate is within Rule 2 as specified in

clause 7.1.2_2.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2_2.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offset is $(624 \times T_S)$ to within the limits specified in Table 7.1.2_2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays at $624\times T_S$ to within the T_e limits specified in Table 7.1.2_2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.2_2.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 1-10 for each sub-test in Tables 7.1.2_2.5-1, 7.1.2_2.5-2 and 7.1.2_2.5-3 as appropriate.

7.1.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.2_2.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.2_2.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.2_2.4.3-3: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [5] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 , bw7 for Test 3	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.2_2.4.3-4: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1, Test3 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.2_2.4.4-5: MAC-MainConfig-RBC: Additional UE transmit timing for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	1		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.2_2.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.2_2.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.2_2.5 Test requirement

Tables 7.1.2_2.5-1, 7.1.2_2.5-2 and 7.1.2_2.5-3 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Tables 7.1.2_2.5-4, 7.1.2_2.5-5 and 7.1.2_2.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.2_2.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
Special subframe configuration[Note1]		6	6	6
Uplink-downlink configuration[Note2]		1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD	R.8 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD	OP.4 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note5]				
OCNG_RB[Note5]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9]
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9]
Note 3: For the reference measurement channels, see section A.2.2.
Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz).
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.2_2.5-3.

Table 7.1.2_2.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Test 3	Comment
	Value			
srsBandwidthConfiguration	bw5	bw5	bw7	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.2_2.5-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.2_2.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2_2.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1 and 3, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.2_2.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1 and 3, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.2_2.5-6.

Table 7.1.2_2.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$18*T_S$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.2_2.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
1.4	$18.6*T_S$
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2_2.5-4.

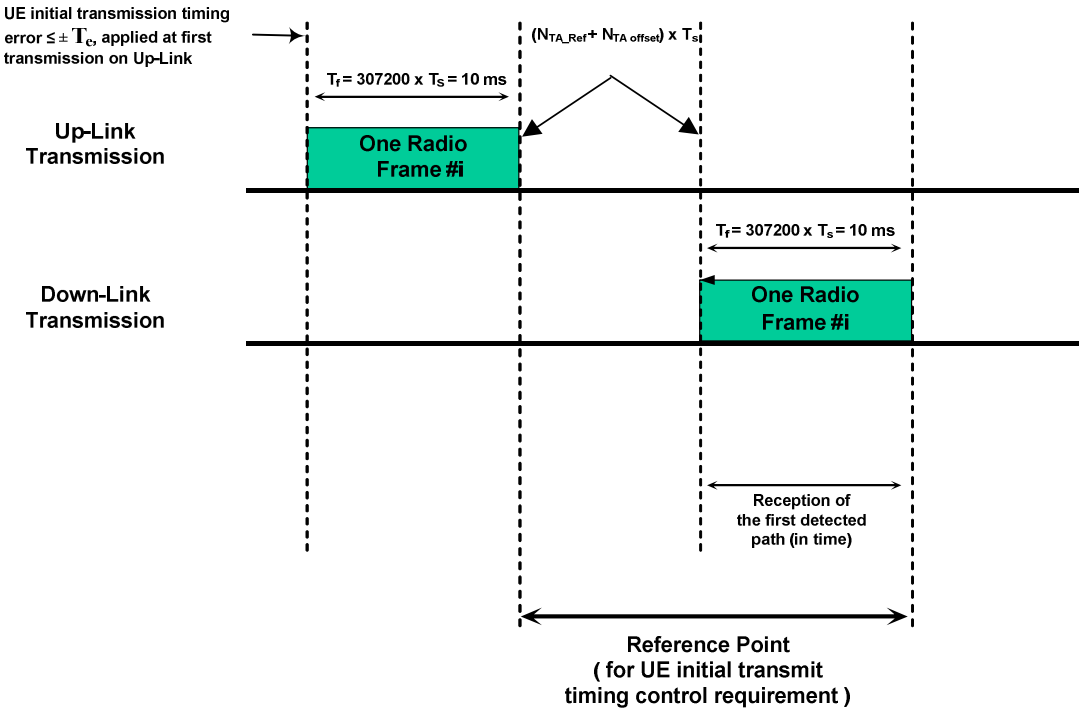

Figure 7.1.2_2.5-4: Illustration of measurement principle

7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell

7.1.3.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.3.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.3.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211.	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.3.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.3.

7.1.3.4 Test description

7.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.3.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.3.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of PCell (Cell 1) is changed is used.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 1-13 for each sub-test in Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 as appropriate.

7.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.3.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.3.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.3.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.3.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.3.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.3.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.3.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.3.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.3.5 Test requirement

Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.3.5-4, 7.1.3.5-5 and 7.1.3.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.3.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	**Test 2**	**Test 1**	**Test 2**
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG
DRX cycle	ms	OFF	80[Note5]	OFF	80[Note5]
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD
OCNG Pattern[Note2]		OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA[Note3] OCNG_RB[Note3]	dB	0	0	0	0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note4]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.12.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.3.5-3.

Table 7.1.3.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc1	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	0	77	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.3.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN FDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.3.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.3.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.3.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.3.5-6.

Table 7.1.3.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.3.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward)

7.1.3_1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.3_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.3_1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.3_1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211.	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.
2. The minimum aggregate adjustment rate shall be 7*T_S per second.
3. The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.3_1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.3.

7.1.3_1.4 Test description

7.1.3_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.3_1.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1, Test 2 and Test 3 in Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 µs) (for Test 1 and Test 2) or $+32 \times T_S$ (for Test 3) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period. For Test 3, the downlink timing adjustment shall be done at (320 ± 15) ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.3_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.3_1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3_1.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of PCell (Cell 1) is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 as appropriate.

7.1.3_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.3_1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.3_1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.3_1.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.3_1.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.3_1.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1, 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.3_1.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0	Test 2	
sf640	0	Test 3	
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.3_1.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.3_1.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.3_1.5 Test requirement

Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.3_1.5-4, 7.1.3_1.5-5 and 7.1.3_1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.3_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Cell 1			Cell 2		
		Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20	20	20
Active PCell		Cell 1	Cell 1	Cell 1			
Active SCell					Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
DRX cycle	ms	N/A	80Note5	640Note5	N/A	80Note5	640Note5
PDCCH/PCFICH/PHICH Reference measurement channelNote1		R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD
OCNG PatternNote2		OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RANote3 OCNG_RBNote3	dB	0	0	0	0	0	0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
IoNote4	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.12.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.3_1.5-3.

Table 7.1.3_1.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Cell 1			Cell 2			Comment
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	

srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].							

Table 7.1.3_1.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN FDD

Field	Test 2		Test 3		Comment
	Cell 1	Cell 2	Cell 1	Cell 2	
onDurationTimer	psf1	psf1	psf1	psf1	
drx-InactivityTimer	psf1	psf1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640	
shortDRX	disable	disable	disable	Disable	
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].					

The UE transmit timing offset shall be within the requirements in Table 7.1.3_1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.3_1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1. For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.3_1.5-5
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.
3. For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.3_1.5-6.

Table 7.1.3_1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.3_1.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	$4.6*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell

7.1.4.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.4.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: TS is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.4.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: TS is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4

7.1.4.4 Test description

7.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.4.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are $624\times T_S$ to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 µs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as

specified in clause 7.1.4.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are $(624 \times T_S)$ to within the limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay at $(624 \times T_S)$ to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.4.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 as appropriate.

7.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.4.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.4.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.4.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.4.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3	Once every 5 subframes	TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			

Table 7.1.4.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	Set according to specific test; 15 for Test 1 and 85 for Test 2	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.4.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.4.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.4.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.4.5 Test requirement

Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.4.5-4, 7.1.4.5-5 and 7.1.4.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
E-UTRA RF Channel Number		1	1	2	2
Active PCell		Cell 1	Cell 1		
Active Scell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG
Special subframe configuration[Note1]		6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern[Note4]		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
PBCH_RA	dB	0	0	0	0
PBCH_RB		0	0		0
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note5]					
OCNG_RB[Note5]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note6]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.8.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.4.5-3.

Table 7.1.4.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	Tset3
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.4.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.4.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.4.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4.5-6.

Table 7.1.4.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward)

7.1.4_1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.4_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4_1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.4_1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: TS is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.
2. The minimum aggregate adjustment rate shall be 7*T_S per second.
3. The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.4_1.3-2.

Table 7.1.4_1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: TS is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4

7.1.4_1.4 Test description

7.1.4_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.4_1.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1, Test 2 and Test 3 in Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are $624\times T_S$ to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 µs) (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period. For Test 3, the downlink timing adjustment shall be done at (320 ± 15) ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.4.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.4_1.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are $(624 \times T_S)$ to within the limits specified in Table 7.1.4_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay at $(624 \times T_S)$ to within the T_e limits specified in Table 7.1.4_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.4_1.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 as appropriate.

7.1.4_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.4_1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.4_1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.4_1.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.4_1.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3	Once every 5 subframes	TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			

Table 7.1.4_1.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	Set according to specific test; 15 for Test 1, 85 for Test 2 and 325 for Test 3	SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3,, respectively.	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.4_1.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0	Test 2	
Sf640	0	Test 3	
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.4_1.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.4_1.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.4_1.5 Test requirement

Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.4_1.5-4, 7.1.4_1.5-5 and 7.1.4_1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD test case

Parameter	**Unit**	**Cell 1**			**Cell 2**		
		Test 1	**Test 2**	**Test 3**	**Test 1**	**Test 2**	**Test 3**

E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20	20	20
E-UTRA RF Channel Number		1	1	1	2	2	2
Active PCell		Cell 1	Cell 1	Cell 1			
Active SCell					Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
Special subframe configuration[Note1]		6	6	6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1	1	1
DRX cycle	ms	OFF	80[Note7]	640[Note7]	OFF	80[Note7]	640[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern[Note4]		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
PBCH_RA	dB	0	0	0	0	0	0
PBCH_RB		0	0	0		0	0
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
OCNG_RA[Note5]							
OCNG_RB[Note5]							
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
Io[Note6]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.8.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.4_1.5-3.

Table 7.1.4_1.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case

Field	Cell 1			Cell 2			Comment
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	
	Tset1	Tset2	Tset3	Tset1	Tset2	Tset3	

srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	325	15	85	325	SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].							

Table 7.1.4_1.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN TDD

Field	Test 2		Test 3		Comment
	Cell 1	Cell 2	Cell 1	Cell 2	
onDurationTimer	psf1	psf1	psf1	psf1	
drx-InactivityTimer	psf1	psf1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640	
shortDRX	disable	disable	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

The UE transmit timing offset shall be within the requirements in Table 7.1.4_1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.4_1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1. For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4_1.5-5.
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.
3. For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4_1.5-6.

Table 7.1.4_1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4_1.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth

7.1.4A.1 Test purpose

Same test purpose as defined in clause 7.1.4.1.

7.1.4A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.4.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4A.

7.1.4A.4 Test description

7.1.4A.4.1 Initial conditions

- Same initial conditions as in clause 7.1.4.4.1 with the following exceptions: Channel Bandwidth to be tested: 20 MHz for Cell 1 on the PCC, 10MHz for Cell 2 on the SCC

7.1.4A.4.2 Test procedure

Same test procedure as in clause 7.1.4.4.2

7.1.4A.4.3 Message contents

Same message contents as in clause 7.1.4.4.3

7.1.4A.5 Test requirement

Table 7.1.4A.5-1, 7.1.4A.5-2 and 7.1.4A.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test. The listed parameter values in Tables 7.1.4A.5-1 will replace the values of corresponding parameters in Table 7.1.4.5-1.

Table 7.1.4A.5-4, 7.1.4A.5-5 and 7.1.4A.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4A.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD for 20 MHz +10 MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	10	10
PDCCH/PCFICH/PHICH Reference measurement channel Note3		R.10 TDD	R.10 TDD	R.6 TDD	R.6 TDD
OCNG Pattern Note4		OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD
Io Note6	dBm/18 MHz	-62.24	-62.24	N/A	N/A
	dBm/9 MHz	N/A	N/A	-65.25	-65.25

Table 7.1.4A.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case for 20 MHz +10 MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 1	Test 1	Test 2	Tset3
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.4A.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD for 20 MHz +10 MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.4A.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.4A.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4A.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4A.5-6.

Table 7.1.4A.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4A.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth

7.1.5.1 Test purpose

Same test purpose as defined in clause 7.1.1.1.

7.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support bands within band group FDD_N.

7.1.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.1.1.3 with the following exceptions:

- Instead of A.7.1.1 → use A.7.1.5.

7.1.5.4 Test description

7.1.5.4.1 Initial conditions

Same initial conditions as defined in 7.1.1.4.1 except that the Channel Bandwidth to be tested is 5MHz as defined in TS 36.508 [7] clause 4.3.1.

7.1.5.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 in Tables 7.1.5.5-1 and 7.1.5.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 µs).
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.5.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.5.5, the SS shall measure the change in SRS transmission timing over a 1.572s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.5.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

7.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.5.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.5.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.5.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc1		
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.5.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	0		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.5.4.3-5: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.5.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.5.5 Test requirement

Tables 7.1.5.5-1 and 7.1.5.5-2 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.5.5-3, 7.1.5.5-4 and 7.1.5.5-5 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.5.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case for 5MHz bandwidth

Parameter	**Unit**	**Value**
		Test 1
Channel Bandwidth ($BW_{channel}$)	MHz	5
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.11 FDD
OCNG Pattern[Note2]		OP.16 FDD
Io[Note4]	dBm/4.5 MHz	-68.27
Note 1: For the reference measurement channels, see clause A.2.1. Note 2: For the OCNG pattern, see clause D.1.16. Note 3: See Table 7.1.1.5-1 for the other parameters. Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.		

Table 7.1.5.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case for 5MHz bandwidth

Field	Test 1	Comment
	Value	
srs-BandwidthConfig	bw5	
srs-SubframeConfig	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	
srsMaxUpPts	N/A	Not applicable for FDD
srs-Bandwidth	0	No hopping
srs-HoppingBandwidth	hbw0	
freqDomainPosition	0	
duration	TRUE	Indefinite duration
srs-ConfigIndex	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift

The UE transmit timing offset shall be within the requirements in Table 7.1.5.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.5.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.5.5-4

2) The minimum aggregate adjustment rate shall be $5.7 \times T_S$ per 1.572 s.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.5.5-5.

Table 7.1.5.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
5	6.0*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.5.5-5: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
5	6.6*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure

7.1.6 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG

7.1.6.1 Test purpose

To verify that the UE is capable of following the frame timing change of the connected System simulator and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG based on the requirements.

7.1.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances and support of FGI bit 5.

7.1.6.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.6.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.6.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$, as long as, for the UE configured with a pTAG and an sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment. If the transmission timing difference is bigger than the maximum transmission timing difference (i.e., 32.47us) UE may stop adjustment. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.6.3-2.

Table 7.1.6.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.6.

7.1.6.4 Test description

7.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.6.4.2 Test procedure

The test consists of two cells, PCell and SCell. PCell and SCell are in the Primary Timing Advance Group (pTAG) and the secondary Timing Advance Group (sTAG) respectively. The transmit timing accuracy is verified related to the downlink frame timing of SCell (Cell 2) in sTAG. The downlink timing of Cell 2 is changed and the change in UE transmit timing of SCell is observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The SS shall check that the UE transmit timing offsets of SCell in sTAG are within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

9. The SS adjusts the downlink transmit timing for the activated SCell (Cell 2) to a delay of $+64 \times T_S$ (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.6.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.6.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.6.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of SCell are within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of the SCell in sTAG stay within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2). In case for Test 2, the SS shall check that the UE transmit timing offsets of the activated SCell (Cell 2) stay within the limit specified in Table 7.1.6.5-4 with respect to the first timing adjustment after downlink frame of the activated SCell (Cell 2) is changed. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of the activated SCell (Cell 2) is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 as appropriate.

7.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.6.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD UE transmit timing accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table 7.1.6.4.3-2: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement for Test 1

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {			
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.6.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {			
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.6.4.3-4: *SCellToAddMod-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.1.6.4.3-5: *RadioResourceConfigCommonSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.1.6.4.3-6: *RadioResourceConfigDedicatedSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.1.6.4.3-7: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.1.6.5 Test requirement

Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test.

Tables 7.1.6.5-4, 7.1.6.5-5 and 7.1.6.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.6.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10	10
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	sTAG	sTAG
DRX cycle	ms	OFF	80[Note5]	OFF	80[Note5]
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	R.6 FDD	R.6 FDD	R.6 FDD
OCNG Pattern[Note2]		OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25	-65.25
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.6.5-3.

Table 7.1.6.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.6.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for E-UTRAN FDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.6.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.6.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.6.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.

3) For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.6.5-6.

Table 7.1.6.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.6.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG

7.1.7.1 Test purpose

To verify that the UE is capable of following the frame timing change of the connected System simulator and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG based on the requirements.

7.1.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation. Applicability requires support for multiple timing advances and FGI bit 5.

7.1.7.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.7.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.7.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$, as long as, for the UE configured with a pTAG and an sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment. If the transmission timing difference is bigger than the maximum transmission timing difference (i.e., 32.47us) UE may stop adjustment. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.7.3-2.

Table 7.1.7.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7.

7.1.7.4 Test description

7.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.7.4.2 Test procedure

The test consists of two cells, PCell and SCell. PCell and SCell are in the Primary Timing Advance Group (pTAG) and the secondary Timing Advance Group (sTAG) respectively. The transmit timing accuracy is verified related to the downlink frame timing of SCell (Cell 2) in sTAG. The downlink timing of Cell 2 is changed and the change in UE transmit timing of SCell is observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of SCell in sTAG are $624 \times T_S$ to within the T_e limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

9. The SS adjusts the downlink transmit timing for the activated SCell (Cell 2) to a delay of $+64 \times T_S$ (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.7.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.7.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.7.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of SCell are $(624 \times T_S)$ to within the limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of the SCell in sTAG stay at $(624 \times T_S)$ to within the T_e limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2). In case for Test 2, the SS shall check that the UE transmit timing offsets of the activated SCell (Cell 2) stay within the limit specified in Table 7.1.7.5-4 with respect to the first timing adjustment after downlink frame of the activated SCell (Cell 2) is changed. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of the activated SCell (Cell 2) is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 as appropriate.

7.1.7.4.3 Message contents

Message contents are same as in Clause 7.1.6.4.3.

7.1.7.5 Test requirement

Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test.

Tables 7.1.7.5-4, 7.1.7.5-5 and 7.1.7.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10	10
E-UTRA RF Channel Number		1	1	2	2
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	sTAG	sTAG
Special subframe configuration[Note1]		6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD	R.6 TDD	R.6 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0	0
PBCH_RB		0	0		0
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note5]					
OCNG_RB[Note5]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	-65.25	-65.25
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.2.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.7.5-3.

Table 7.1.7.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for E-UTRAN TDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.7.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7.5-6.

Table 7.1.7.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth

7.1.7A.1 Test purpose

Same test purpose as defined in clause 7.1.7.1.

7.1.7A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances. Applicability requires support for FGI bit 5.

7.1.7A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.7.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7A.

7.1.7A.4 Test description

7.1.7A.4.1 Initial conditions

Same initial conditions as in clause 7.1.7.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell

7.1.7A.4.2 Test procedure

Same test procedure as in clause 7.1.7.4.2

7.1.7A.4.3 Message contents

Same message contents as in clause 7.1.7.4.3

7.1.7A.5 Test requirement

Table 7.1.7A.5-1, 7.1.7A.5-2 and 7.1.7A.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test. The listed parameter values in Tables 7.1.7A.5-1 will replace the values of corresponding parameters in Table 7.1.7.5-1 other parameters keep the same.

Table 7.1.7A.5-4, 7.1.7A.5-5 and 7.1.7A.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7A.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for 20MHz +20MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern defined in D.2.8 (OP.8 TDD)		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
Io Note1	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Note 1: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.1.7A.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for 20MHz +20MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7A.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for 20MHz +20MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7A.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.7A.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7A.5-5.
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.
3. For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7A.5-6.

Table 7.1.7A.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4.0*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7A.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	$4.6*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth

7.1.7B.1 Test purpose

Same test purpose as defined in clause 7.1.7.1.

7.1.7B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances. Applicability requires support for FGI bit 5.

7.1.7B.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.7.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7B.

7.1.7B.4 Test description

7.1.7B.4.1 Initial conditions

Same initial conditions as in clause 7.1.7.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for PCell and 10 MHz for SCell

7.1.7B.4.2 Test procedure

Same test procedure as in clause 7.1.7.4.2.

7.1.7B.4.3 Message contents

Same message contents as in clause 7.1.7.4.3.

7.1.7B.5 Test requirement

Table 7.1.7B.5-1, 7.1.7B.5-2 and 7.1.7B.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test. The listed parameter values in Tables 7.1.7B.5-1 will replace the values of corresponding parameters in Table 7.1.7.5-1 other parameters keep the same.

Table 7.1.7B.5-4, 7.1.7B.5-5 and 7.1.7B.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7B.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for 20MHz +10MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	10	10
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		R.10 TDD	R.10 TDD	R.6 TDD	R.6 TDD
OCNG Pattern defined in D.2.2 (OP.2 TDD) and in D.2.8 (OP.8 TDD)		OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD
Io^{Note1}	dBm/18 MHz	-62.24	-62.24	-	-
	dBm/9 MHz	-	-	-65.25	-65.25
Note 1: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.1.7B.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for 20MHz +10MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7B.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for 20MHz +10MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7B.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.7B.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7B.5-5
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3. For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7B.5-6.

Table 7.1.7B.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7B.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.8 Void

7.1.9 Void

7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

7.1.10.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.10.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.10.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.10.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are

configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.10.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.10.3-2.

Table 7.1.10.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.10.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.10.4 Test description

7.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.10.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32 \times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.10.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.10.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.10.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF –CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 as appropriate.

7.1.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.10.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.10.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.10.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.10.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw1		
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.10.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.10.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.10.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.10.5 Test requirement

Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.10.5-4, 7.1.10.5-5 and 7.1.10.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.10.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80[Note5]	640[Note5]
PRACH Configuration		PRACH_2CE As specified in A.9		
MPCCH Reference measurement channel[Note1]		R.16 FDD	R.16 FDD	R.16 FDD
OCNG Pattern[Note2]		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3+.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.7.1.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.10.5-3.

Table 7.1.10.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 4, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

Table 7.1.10.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

For parameters specified in Tables 7.1.10.5-1 and 7.1.10.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.24.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.24.2 until the UE transmit timing offset is within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.10.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.10.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	$27*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.10.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.10.5-6.

Table 7.1.10.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.10.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	18.6*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

7.1.11.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.11.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.11.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.11.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.11.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.11.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.11.3-2.

Table 7.1.11.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.11.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.11.4 Test description

7.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.11.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.11.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32 \times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Void.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.11.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.11.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF –CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 as appropriate.

7.1.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.11.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.11.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.11.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.11.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw1		
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.11.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.11.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.11.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.11.5 Test requirement

Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN HD-FDD test.

Tables 7.1.11.5-4, 7.1.11.5-5 and 7.1.11.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.11.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80[Note5]	640[Note5]
PRACH Configuration		PRACH_2CE As specified in A.9		
MPCCH Reference measurement channel[Note1]		R.16 HD-FDD	R.16 HD-FDD	R.16 HD-FDD
OCNG Pattern[Note2]		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.7.2.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.11.5-3.

Table 7.1.11.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeA test case

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 4, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

Table 7.1.11.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

For parameters specified in Tables 7.1.11.5-1 and 7.1.11.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.24.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.24.2 until the UE transmit timing offset is within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.11.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.11.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	$27*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.11.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.11.5-6.

Table 7.1.11.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.11.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	18.6*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

7.1.12.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.12.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.12.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.12.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to Te where the timing error limit value Te is specified in Table 7.1.10.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.12.3-2.

Table 7.1.12.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.12.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.12.4 Test description

7.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.12.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is 624× T_S to within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 μs) for Test 1 and Test2 and to and a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.12.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.12.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.12.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.12.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 as appropriate.

7.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.12.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.12.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.12.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		TDD
}			

Table 7.1.12.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw1		
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and 85 for Test 2 and 325 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.12.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.12.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.12.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.12.5 Test requirement

Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.12.5-4, 7.1.12.5-5 and 7.1.12.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.12.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
Special subframe configuration[Note1]		6	6	6
Uplink-downlink configuration[Note2]		1	1	1
DRX cycle	Ms	N/A	80[Note7]	640[Note7]
PRACH configuration		PRACH_4CE As specified in A.9		
MPDCCH Reference measurement channel[Note3]		R.14 TDD	R.14 TDD	R.14 TDD
OCNG Pattern[Note4]		OP.11 TDD	OP.11 TDD	OP.11 TDD
PBCH_RA	dB	0	0	0
PBCH_RB		0	0	0
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note5]				
OCNG_RB[Note5]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: For the reference measurement channels, see clause A.7.3.
Note 4: For the OCNG pattern, see clause D.2.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.12.5-3.

Table 7.1.12.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeA test case

Field	Values			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	Bw5	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
Duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	325	SRS periodicity of 10, 80, 10 and 320 ms for Test 1, 2, 3 and 4 respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Table 7.1.12.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

For parameters specified in Tables 7.1.11.5-1 and 7.1.11.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.24.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.24.2 until the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624)\times T_S \pm 27\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.12.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.12.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	$27*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.12.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.12.5-6.

Table 7.1.12.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	$18*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.12.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	$18.6*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.13 3DL/3UL TDD CA UE Transmit Timing Accuracy Tests for 2 SCells

7.1.13.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits for SCell in sTAG based on the requirements.

7.1.13.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward that supports Uplink Carrier Aggregation and multiple timing advances. Applicability requires support for FGI bit 5.

7.1.13.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.13.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.13.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in TS 36.133 [4] clause 7.3 is applied.

When in a TAG the transmission timing error between the UE and the reference timing exceeds $\pm T_e$, or in a sTAG the UE changes the downlink SCell for deriving the UE transmit timing for cells in the sTAG configured with one or two uplinks, the UE is required to adjust its timing to within $\pm T_e$ in that TAG, as long as,

- the UE is configured with a pTAG and one or two sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment, or

- the UE is configured with synchronous dual connectivity, the transmission timing difference between pTAG and psTAG does not exceed the maximum transmission timing difference (i.e., 35.21us) after such adjustment.

If the transmission timing difference after such adjustment is bigger than the maximum transmission timing difference UE may stop adjustment in this TAG. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing under the above mentioned scenarios shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.13.3-2.

Table 7.1.13.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.13.

7.1.13.4 Test description

7.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.1.13.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For Ues supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For Ues supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For Pcell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell1 and Cell 3 is SCell2. Cell 1 is in the primary Timing Advance Group (pTAG). Cell 2 and Cell 3 are in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

7.1.13.4.2 Test procedure

The test consists of three cells, PCell, SCell1 and SCell2. The transmit timing accuracy is verified related to the downlink frame timing of the activated SCell1 (Cell 2) or SCell2 (Cell3). The downlink timing of the activated SCell1 (Cell 2) or SCell2 (Cell3) is changed and the changes in UE transmit timing of SCell1 and SCell2 are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell1 (Cell 2) on the SCC1 and SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.13.5-1, 7.1.13.5-2 and 7.1.13.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of SCell1 and SCell2 in sTAG are $624\times T_S$ to within the T_e limits specified in Table 7.1.13.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell1 (Cell 2) or SCell2 (Cell3).
9. The SS adjusts the downlink timing for the activated SCell1 (Cell 2) and SCell2 (Cell3) to a delay of $+64 \times T_S$ (approximately +2 µs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.13.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.13.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.13.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are $(624 \times T_S)$ to within the limits specified in Table 7.1.13.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell1 (Cell 2) or SCell2 (Cell3).
11. In case for Test 1, the SS shall check that the UE transmit timing offsets of SCell1 and SCell2 stay at $(624 \times T_S)$ to within the T_e limits specified in Table 7.1.13.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell1 (Cell 2) or SCell2 (Cell3). In case for Test 2, the SS shall check that the UE transmit timing offsets of SCell1 and SCell2 stay within the limits specified in Table 7.1.13.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of the activated SCell1 (Cell 2) or SCell2 (Cell3) is changed is used.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 1-13 for each sub-test in Tables 7.1.13.5-1, 7.1.13.5-2 and 7.1.13.5-3 as appropriate.

7.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.13.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.13.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.13.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.13.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3	Once every 5 subframes	TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			

Table 7.1.13.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	Set according to specific test; 15 for Test 1 and 85 for Test 2	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.13.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	Sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0	Test 2	
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.13.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.13.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.13.5 Test requirement

Tables 7.1.13.5-1, 7.1.13.5-2 and 7.1.13.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.13.5-4, 7.1.13.5-5 and 7.1.13.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.13.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for SCell1 and SCell2 in sTAG for 3DL/3UL TDD CAE-UTRAN TDD

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		Test 1	Test 2	Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2	3	3
Channel Bandwidth ($BW_{channel}$)	MHz	5, 10, 20	5, 10, 20	5, 10, 20	5, 10, 20	5, 10, 20	5, 10, 20
Active PCell		Cell 1	Cell 1				
Active SCell				Cell 2	Cell 2	Cell 3	Cell 3
TAG configuration		pTAG	pTAG	sTAG	sTAG	sTAG	sTAG
Special subframe configuration[Note1]		6	6	6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF	80[Note7]	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.11 TDD , R.6 TDD, R.10 TDD	R.11 TDD , R.6 TDD, R.10 TDD	R.11 TDD , R.6 TDD, R.10 TDD	R.11 TDD , R.6 TDD, R.10 TDD	R.11 TDD , R.6 TDD, R.10 TDD	R.11 TDD , R.6 TDD, R.10 TDD
OCNG Pattern[Note4]		OP.10 TDD , OP.2 TDD, OP.8 TDD	OP.10 TDD , OP.2 TDD, OP.8 TDD	OP.10 TDD , OP.2 TDD, OP.8 TDD	OP.10 TDD , OP.2 TDD, OP.8 TDD	OP.10 TDD , OP.2 TDD, OP.8 TDD	OP.10 TDD , OP.2 TDD, OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA[Note5] OCNG_RB[Note5]	dB	0	0	0	0	0	0
N_{oc}	dBm/ 15 kHz	-98	-98	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
Io[Note6]	dBm/ 4.5 MHz	-68.26	-68.26	-68.26	-68.26	-68.26	-68.26
	dBm/ 9 MHz	-65.2	-65.2	-65.2	-65.2	-65.2	-65.2
	dBm/ 18MHz	-62.24	-62.24	-62.24	-62.24	-62.24	-62.24
Timing offset to Cell 1	µs	-		0		0	
Time alignment error relative to cell 1 [Note 8]	µs	-		≤ TAE		≤ TAE	
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table A.7.1.13.5-3.
Note 8: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 7.1.13.5-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for SCell1 and SCell2 in sTAG for 3DL/3UL TDD CA

Field	Cell 1		Cell 2		Cell 3		Comment
	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
Note 1: For further information see clause 6.3.2 in TS 36.331.							

Table 7.1.13.5-3: DRX Configuration to be used in Test 2 of UE Transmit Timing Accuracy for SCell1 and SCell2 in sTAG for 3DL/3UL TDD CA

Field	Cell 1	Cell 2	Cell 3	Comment
onDurationTimer	psf1	psf1	psf1	
drx-InactivityTimer	psf1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	sf80	
shortDRX	disable	disable	Disable	
Note 1: For further information see clause 6.3.2 in TS 36.331.				

After the Scell1 (Cell 2) and Scell2 (Cell 3) are activated, the UE transmit timing offsets for Scell1 and Scell2 in sTAG shall be within the requirements in Table 7.1.13.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated Scell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.13.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1. For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.13.5-5.
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.
3. For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.13.5-6.

Table 7.1.13.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
5	6.0*T_S
≥10	4.0*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.13.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
5	6.6*T_S
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

7.1.14.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.14.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.14.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.14.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.14.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.14.3-2.

Table 7.1.14.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.14.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.14.4 Test description

7.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.14.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of + 64 × T_S (approximately +2 μs) for Test 1 and Test2 and to and a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.14.5. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.14.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.14.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 as appropriate.

7.1.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.14.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.14.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.14.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.14.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.14.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.14.5 Test requirement

Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.14.5-4, 7.1.14.5-5 and 7.1.14.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.14.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
DRX cycle		ms	N/A	80[Note5]	640[Note5]
MPCCH Reference measurement channel[Note1]			R.18 FDD	R.18 FDD	R.18 FDD
OCNG Pattern[Note2]			OP.21 FDD	OP.21 FDD	OP.21 FDD
Number of repetitions	MPDCCH		[128]		
	MPUSCH		[32]		
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$		dB	-11.7	-11.7	-11.7
$\hat{E}_s / N_{oc}$		dB	-11.7	11.7T	-11.7
Io[Note4]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.4.7.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.14.5-2.

Table 7.1.14.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

For parameters specified in Tables 7.1.14.5-1 and 7.1.14.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 51 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +64×T_S (for Test 1 and Test 2) or +32×T_S (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within N_{TA}×T_S ± 51×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± 51×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.14.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.14.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	51*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.14.5-5

2) The minimum aggregate adjustment rate is not a meaningful test as the maximum adjustment step of 18T_s is much greater than the minimum aggregate adjustment rate of 7 * Ts per second, in any 1s period the UE may not make any timing adjustment. A test would therefore be meaningless and this test limit is not applied.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.14.5-6.

Table 7.1.14.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.14.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198 ms[3]
B	18.6*T_S(f > 1 GHz) 19.2*T_S(f ≤ 1 GHz)
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth. NOTE 3: The maximum adjustment rate requirement depends on the frequency of the operating band under test.	

7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

7.1.15.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.15.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.15.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.15.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.15.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.15.3-2.

Table 7.1.15.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.15.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.15.4 Test description

7.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.15.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.15.5. To check that the maximum adjustment rate is

within Rule 3 as specified in clause 7.1.15.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.15.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 as appropriate.

7.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.15.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.15.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.15.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.15.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.15.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.15.5 Test requirement

Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN HD-FDD test.

Tables 7.1.15.5-4, 7.1.15.5-5 and 7.1.15.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.15.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
DRX cycle		ms	N/A	80[Note5]	640[Note5]
MPCCH Reference measurement channel[Note1]			R.6 HD-FDD	R.6 HD-FDD	R.6 HD-FDD
OCNG Pattern[Note2]			OP.21 FDD	OP.21 FDD	OP.21 FDD
Number of repetitions	MPDDCH		[128]		
	MPUSCH		[32]		
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$		dB	-11.7	-11.7	-11.7
$\hat{E}_s / N_{oc}$		dB	-11.7T	11.7	11.7
Io[Note4]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.7.5.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.15.5-2.

Table 7.1.15.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

For parameters specified in Tables 7.1.15.5-1 and 7.1.15.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 51 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +64×T_S (for Test 1 and Test 2) or +32×T_S (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within N_{TA}×T_S ± 51×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± 51×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.15.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.15.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	51*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.15.5-5

2) The minimum aggregate adjustment rate is not a meaningful test as the maximum adjustment step of 18T_s is much greater than the minimum aggregate adjustment rate of 7 * Ts per second, in any 1s period the UE may not make any timing adjustment. A test would therefore be meaningless and this test limit is not applied.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.15.5-6.

Table 7.1.15.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.15.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198 ms[3]
B	18.6*T_S(f > 1 GHz) 19.2*T_S(f ≤ 1 GHz)
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth. NOTE 3: The maximum adjustment rate requirement depends on the frequency of the operating band under test.	

7.1.16 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

7.1.16.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.16.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.16.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.16.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.16.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*T_S
B	48*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.16.3-2.

Table 7.1.16.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.16.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.16.4 Test description

7.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.16.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.16.5. To check that the maximum adjustment rate is

within Rule 3 as specified in clause 7.1.16.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.16.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 as appropriate.

7.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.16.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.1.16.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.16.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.16.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.16.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.16.5 Test requirement

Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.16.5-4, 7.1.16.5-5 and 7.1.16.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.16.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
Special subframe configuration[Note1]			6	6	6
Uplink-downlink configuration[Note2]			1	1	1
DRX cycle		ms	N/A	80[Note7]	640[Note7]
MPDCCH Reference measurement channel[Note3]			R.16 TDD	R.16 TDD	R.16 TDD
OCNG Pattern[Note4]			OP.11 TDD	OP.11 TDD	OP.11 TDD
PBCH_RA		dB	0	0	0
Number of repetitions	MPDCCH		128		
	MPUSCH		32		
PBCH_RB			0	0	0
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note5]					
OCNG_RB[Note5]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$		dB	-11.7	11.7	-11.7
$\hat{E}_s / N_{oc}$		dB	-11.7	-11.7	-11.7
Io[Note6]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: For the reference measurement channels, see clause A.7.6.
Note 4: For the OCNG pattern, see clause D.2.11.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.16.5-2.

Table 7.1.16.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

For parameters specified in Tables 7.1.16.5-1 and 7.1.16.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}\times T_S \pm 51\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $N_{TA}\times T_S \pm 51\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm 51\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.16.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.16.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	$51*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.16.5-5

2) The minimum aggregate adjustment rate is not a meaningful test as the maximum adjustment step of $18T_s$ is much greater than the minimum aggregate adjustment rate of 7 * Ts per second, in any 1s period the UE may not make any timing adjustment. A test would therefore be meaningless and this test limit is not applied.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.16.5-6.

Table 7.1.16.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	$18*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.16.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198 ms[3]
B	18.6*T_S(f > 1 GHz) 19.2*T_S(f ≤ 1 GHz)
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth. NOTE 3: The maximum adjustment rate requirement depends on the frequency of the operating band under test.	

7.1.17 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Normal Coverage

7.1.17.1 Test purpose

To verify that the Category NB1 UE under normal coverage is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits.

7.1.17.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

7.1.17.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.20 and shown in table in Table 7.1.17.3-1. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the serving NB-IoT cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the serving NB-IoT cell. $N_{\text{TA\_Ref}}$ for NPRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in TS 36.133 clause 7.22 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.17.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	80*T_S
Note 1: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for NPUSCH the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving NB-IoT cell except when the timing advance in TS 36.133 clause 7.22 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$, where the timing error limit value T_e is specified in Table 7.1.17.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be 58.33*T_S seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be 58.33*T_S per 200ms.

The normative reference for this requirement is TS 36.133 [4] clause 7.20 and A.7.1.17.

7.1.17.4 Test description

7.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.1.17.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set according to Table 7.1.17.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.17.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
NB-IoT Operation mode		In-band
DRX		OFF
NPRACH configuration		As specified in A.10.3
NPDCCH repetition level		1
npdcch-StartSF-USS Note 1		v8
npdcch-NumRepetitions-r13 Note 1		r1
NPUSCH repetition level		1
Note 1: For further information see clause 6.7.3.2 in TS 36.331 [5].		

7.1.17.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Ncell 1. The downlink timing of Ncell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting NPUSCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in idle State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to Tables 7.1.17.5-1 and 7.1.17.5-2. Propagation conditions are set according to Annex B clause B.1.1.
3. SS sends uplink scheduling information via NPDCCH DCI format N0 for C_RNTI to schedule uplink subframes.
4. The UE shall transmit NPUSCH and the SS shall measure the UE transmit timing offset ($n \times Ts$).
5. Using the value of n measured in step 4, the SS calculates the size of the downlink transmit timing for the Ncell 1:
   - if $n < 0$, by $+(144 - |n|) \times T_S$ compared to that in step 4.
   - if $n \geq 0$, by $-(144 - |n|) \times T_S$ compared to that in step 4.
6. Before applying the downlink transmit timing adjustment, the SS sends NPDCCH including uplink grant, measures the timing of the resulting NPUSCH, and verifies that it is within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of NB-IoT cell 1. The SS also records the measured value for use in step 8.

7. Immediately after Step 6, The downlink timing adjustment is performed monotonically in multiple steps of $|\Delta T| \leq 9 \times T_S$ per 256ms until the above required total timing change is achieved, during which no grant is transmitted for the UE.

8. Immediately after Step 7, the SS sends NPDCCH including uplink grant for NPUSCH transmission and immediately after receiving NPUSCH the test system repeatedly sends NPDCCH including uplink grant for NPUSCH transmission. The SS samples the UE Transmit Timing once per NPUSCH transmission. The SS shall check that the maximum time adjustment step size between the first NPUSCH transmission in step 8 and the NPUSCH transmission in step 6 is within Rule 1 as specified in clause 7.1.17.5. And using the first NPUSCH transmission in step 8 and subsequent NPUSCH transmissions, the SS shall check the difference in timing between one NPUSCH transmission to the next is within Rule 1 as specified in clause 7.1.17.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.17.5, the SS shall measure the change in NPUSCH transmission timing over a 1008ms sliding window, with step size 8ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.17.5, the SS shall measure the change in NPUSCH transmission timing over a 192ms sliding window, with step size 8ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

9. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

7.1.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.1.17.4.3-1: NPDCCH-ConfigDedicated-NB: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Normal Coverage

Derivation Path: 36.331 clause 6.7.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDCCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
npdcch-NumRepetitions-r13	r1	Set NPDCCH repetition to 1	
npdcch-StartSF-USS-r13	v8		
npdcch-Offset-USS-r13	zero		
}			

7.1.17.5 Test requirement

Tables 7.1.17.5-1, 7.1.17.5-2 define the primary settings of Ncell and Cell for UE transmit timing accuracy for HD-FDD Category NB1 UE transmit timing accuracy test.

Table 7.1.17.5-3 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.17.5-1: Ncell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
RF Channel Number		1
$BW_{channel}$	kHz	200
PRB location within Cell		eCell $BW_{channel}$ 5MHz: 17 eCell $BW_{channel}$ 10MHz: 30
NPDSCH parameter defined in clause A.10.2		eCell $BW_{channel}$ 5MHz: R.17 HD-FDD eCell $BW_{channel}$ 10MHz: R.15 HD-FDD
NPDCCH parameter defined in clause A.10.1		eCell $BW_{channel}$ 5MHz: R.41 HD-FDD eCell $BW_{channel}$ 10MHz: R.29 HD-FDD
NPBCH_RA	dB	-3
NPBCH_RB		
NPSS_RA		
NSSS_RA		
NPDCCH_RA		
NPDCCH_RB		
NPDSCH_RA		
NPDSCH_RB		
NOCNG_RA Note1		
NOCNG_RB Note1		
N_{oc}	dBm/15 kHz	Specified in Table 7.1.17.5-2
$\hat{E}_s / I_{ot}$	dB	4.3
$\hat{E}_s / N_{oc}$	dB	4.3
Antenna Configuration		2x1
Propagation condition	-	AWGN
Note 1 NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 7.1.17.5-2: eCell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB		
PSS_RA		
SSS_RA		
PCFICH_RB		
PHICH_RA		
PHICH_RB		
PDCCH_RA		
PDCCH_RB		
OCNG_RA Note1		
OCNG_RB Note1		
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	4
Antenna configuration		2x1
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

The UE transmit timing offset shall be within the requirements in Table 7.1.17.5-3.

Table 7.1.17.5-3: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow three rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be $58.83*T_S$ seconds.

2) The minimum aggregate adjustment rate shall be 3.4*TS per 1008ms for carrier frequency under 1 GHz or 0.4*TS per 1008ms for carrier frequency over 1 GHz.

3) The maximum aggregate adjustment rate shall be $59.43*T_S$ per 192ms for carrier frequency under 1 GHz or $60.03*T_S$ per 192ms for carrier frequency over 1 GHz.

7.1.18 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Enhanced Coverage

7.1.18.1 Test purpose

To verify that the Category NB1 UE under enhanced coverage is capable of following the frame timing change of the connected eNode B, that the UE initial transmit timing accuracy is within the specified limits and that the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission.

7.1.18.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

7.1.18.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.20 and shown in table in Table 7.1.18.3-1. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the serving NB-IoT cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the serving NB-IoT cell. $N_{\text{TA\_Ref}}$ for NPRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in TS 36.133 clause 7.22 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.18.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$80*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for NPUSCH the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving NB-IoT cell except when the timing advance in TS 36.133 clause 7.22 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$, where the timing error limit value T_e is specified in Table 7.1.18.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be $58.33*T_S$ seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be $58.33*T_S$ per 200ms.

The normative reference for this requirement is TS 36.133 [4] clause 7.20 and A.7.1.18.

7.1.18.4 Test description

7.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.1.18.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main Tx/Rx antenna and without using the faders.

2. The general test parameter settings are set according to Table 7.1.18.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA FDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.18.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
NB-IoT Operation mode		In-band	In-band
DRX		OFF	ON
NPRACH configuration		As specified in A.3.18	
NPDCCH repetition level		32	32
npdcch-StartSF-USS Note 2		v2	v2
npdcch-NumRepetitions-r13 Note 2		r32	r32
NPUSCH resource units		1	1
NPUSCH repetition level		128	128
NPUSCH subcarrier spacing	kHz	15	15
NPUSCH number of subcarriers		1	1
NPUSCH modulation		π /4QPSK	π /4QPSK
NPUSCH Transport block size	Bits	40	40
Note 1: DRX related parameters are defined in Table A.7.1.18.1-4. Note 2: For further information see clause 6.7.3.2 in TS 36.331 [2].			

7.1.18.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Ncell 1. The downlink timing of Ncell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting NPUSCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in idle State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to Tables 7.1.18.5-1 and 7.1.18.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS sends uplink scheduling information via NPDCCH DCI format N0 for C_RNTI to schedule uplink subframes.

4. The UE shall transmit NPUSCH and the SS shall measure the UE transmit timing offset (n×Ts) and verify that it is within the limits specified in Table 7.1.18.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

5. The test system sends NPDCCH including uplink grant for NPUSCH transmission. After 16ms from the initial NPUSCH transmission, the test system adjusts the downlink transmit timing for the Ncell using the value of n measured in step 4.

   - if $n < 0$, by $+(144 - |n|)\times T_S$ compared to that in step 4.

   - if $n \geq 0$, by $-(144 - |n|)\times T_S$ compared to that in step 4.

   The timing adjustment is performed monotonically in multiple steps of $|\Delta T| \leq 9\times T_S$ per 256ms (ΔT is to be defined in the test procedure) until the above required total timing change is achieved, during which no grant is transmitted for the UE.

6. Step 6 applies for Test 2, but is omitted for Test 1. The SS sends NPDCCH including uplink grant for NPUSCH transmission and shall verify that the UE transmit timing offset stays within the limits specified in Table

7.1.18.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of NB-IoT Ncell 1. For test 2 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

7.1.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.1.18.4.3-1: *MAC-MainConfig-NB*: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.8, Table 8.1.8.2.1.5-1: MAC-MainConfig-NB-SRB			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-NB-SRB ::= SEQUENCE {			
drx-Config-r13 CHOICE {			
setup SEQUENCE {			
onDurationTimer-r13	pp1		
drx-InactivityTimer-r13	pp0		
drx-RetransmissionTimer-r13	pp0		
drx-Cycle-r13	sf2048		
drx-StartOffset-r13	0		
drx-ULRetransmissionTimer-r13	pp0		
}			
}			
}			

Table 7.1.18.4.3-2: NPDCCH-ConfigDedicated-NB: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.6, Table 8.1.6.3-3: NPDCCH-ConfigDedicated-NB-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDCCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
npdcch-NumRepetitions-r13	r32	Set NPDCCH repetition to 32	
npdcch-StartSF-USS-r13	v2		
}			

Table 7.1.18.4.3-3:NB-IoT Physical layer parameters for DCI format N0: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.3, Table 8.1.3.6.1.1-1: NB-IoT Physical layer parameters for DCI format N0				
Parameter	**Value**	**Value in binary**	**Comment**	**Condition**
Repetition number	*7*	“111”	Set NPUSCH repetition to 128	

Table 7.1.18.4.3-4: *RRCConnectionSetup-NB*: HD-FDD Category NB1 UE Transmit Timing Accuracy Test 2 requirement under Enhanced Coverage

Derivation Path: TS 36.508 [7] clause8.1.6.1, Table 8.1.6.1-14: RRCConnectionSetup-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetup-NB ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetup-r13 SEQUENCE {			
radioResourceConfigDedicated-r13{			
srb-ToAddModList-r13 SEQUENCE (SIZE (1)) OF SEQUENCE {}			
mac-MainConfig CHOICE {	MAC-MainConfig-NB-SRB		
}			
}			
}			
}			
}			

7.1.18.5 Test requirement

Tables 7.1.18.5-1, 7.1.18.5-2 and 7.1.18.5-3 define the primary settings of Ncell and Cell for UE transmit timing accuracy for HD-FDD Category NB1 UE transmit timing accuracy test.

Table 7.1.18.5-4 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.18.5-1: Ncell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
RF Channel Number		1	1
$BW_{channel}$	kHz	200	200
PRB location within Cell		eCell1 $BW_{channel}$ 5MHz: 17 eCell1 $BW_{channel}$ 10MHz: 30	eCell1 $BW_{channel}$ 5MHz: 17 eCell1 $BW_{channel}$ 10MHz: 30
NPDSCH parameter defined in clause A.10.2		eCell1 $BW_{channel}$ 5MHz:R.17 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.15 HD-FDD	eCell1 $BW_{channel}$ 5MHz: R.17 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.15 HD-FDD
NPDCCH parameter defined in clause A.10.1		eCell1 $BW_{channel}$ 5MHz: R.41 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.29 HD-FDD	eCell1 $BW_{channel}$ 5MHz: R.41 HD-FDD eCell1 $BW_{channel}$ 10MHz: R.29 HD-FDD
NPBCH_RA	dB	-3	-3
NPBCH_RB			
NPSS_RA			
NSSS_RA			
NPDCCH_RA			
NPDCCH_RB			
NPDSCH_RA			
NPDSCH_RB			
NOCNG_RA Note1			
NOCNG_RB Note1			
N_{oc}	dBm/15 kHz	Specified in Table 7.1.18.5-2	Specified in Table 7.1.18.5-2
$\hat{E}_s / I_{ot}$	dB	-10.7	-10.7
$\hat{E}_s / N_{oc}$	dB	-10.7	-10.7
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1 NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.18.5-2: eCell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
E-UTRA RF Channel Number		1	1
$BW_{channel}$	MHz	5 or 10	5 or 10
NOCNG pattern		$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3	-3
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc}	dBm/15 kHz	-98	-98
$\hat{E}_s / N_{oc}$	dB	-11	-11
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1 OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.18.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN HD-FDD Category NB1 UE In-band mode under enhanced coverage

Field	Value	Comment
	Test 2	
onDurationTimer	pp1	
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
longDRX-CycleStartOffset	sf2048	
shortDRX	disable	
Note 1: For further information see clause 6.7.3 in TS 36.331.		

The UE transmit timing offset shall be within the requirements in Table 7.1.18.5-4. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH transmission.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.18.5-4: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

7.1.21 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA

7.1.21.1 Test purpose

To verify that the CE UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.21.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 14 and forward of UE category M2 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.1.21.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.26.2 and shown in table 7.1.21.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.21.3-1: T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
A	1.4	$24*T_S$
A	5	$12*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.21.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7 * T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.21.3-2.

Table 7.1.21.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	$17.5*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.26 and A.7.1.21.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.21.4 Test description

7.1.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.21.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.21.5-1, 7.1.21.5-2 and 7.1.21.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.21.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 µs) for Test 1 and Test2 and to a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.21.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.21.5, the SS shall

measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.21.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.21.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.21.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.21.5-1, 7.1.21.5-2 and 7.1.21.5-3 as appropriate.

7.1.21.4.3 Message contents

Same message contents as defined in clause 7.1.10.4.3.

7.1.21.5 Test requirement

Tables 7.1.21.5-1, 7.1.21.5-2 and 7.1.21.5-3 define the primary settings including test tolerances for E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA test.

Tables 7.1.21.5-4, 7.1.21.5-5 and 7.1.21.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.21.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD Cat-M2 UE under CEModeA

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80[Note5]	640[Note5]
PRACH Configuration		PRACH_4CE As specified in A.9		
MPDCCH Reference measurement channel[Note1]		R.16 FDD	R.16 FDD	R.16 FDD
OCNG Pattern[Note2]		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A

Propagation condition	-	AWGN	AWGN	AWGN
Note 1: For the reference measurement channels, see Annex A.7.				
Note 2: For the OCNG pattern, see Annex D.				
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.				
Note 5: DRX related parameters are defined in Table A.7.1.21.5-3.				

Table 7.1.21.5-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN FDD Cat-M2 UE under CEModeA

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission
Note 1: For further information see clause 6.3.2 in TS 36.331 [5].				

Table 7.1.21.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN FDD Cat-M2 UE under CEModeA

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331 [5].			

For parameters specified in Tables 7.1.21.5-1 and 7.1.21.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.26.2 in TS 36.133 [4].

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 15 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64 \times T_S$ (for Test 1 and Test 2) or $+32 \times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.26.2 in TS 36.133 [4] until the UE transmit timing offset is within $N_{TA} \times T_S \pm 15 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA} \times T_S \pm 15 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.21.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$

Table 7.1.21.5-4: Test requirement for T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
A	1.4	$27*T_S$
A	5	$15*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.21.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.21.5-6.

Table 7.1.21.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	$18*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.21.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	$18.6*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.22 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA

7.1.22.1 Test purpose

To verify that the CE UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.22.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 14 and forward of UE category M2 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.1.22.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.21.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.26 and A.7.1.22.

7.1.22.4 Test description

7.1.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.22.4.2 Test procedure

Same test procedure as defined in clause 7.1.21.4.2.

7.1.22.4.3 Message contents

Same message contents as defined in clause 7.1.11.4.3.

7.1.22.5 Test requirement

Tables 7.1.22.5-1, 7.1.22.5-2 and 7.1.22.5-3 define the primary settings including test tolerances for E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA test.

Tables 7.1.22.5-4, 7.1.22.5-5 and 7.1.22.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.22.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN HD-FDD Cat-M2 UE under CEModeA

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80Note5	640Note5
PRACH configuration		PRACH_4CE As specified in A.9		
MPDCCH Reference measurement channelNote1		R.6 HD-FDD	R.6 HD-FDD	R. 6 HD-FDD
OCNG PatternNote2		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RANote3				
OCNG_RBNote3				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
IoNote4	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see Annex A.7.
Note 2: For the OCNG pattern, see Annex D.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.22.5-3.

Table 7.1.22.5-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN HD-FDD Cat-M2 UE under CEModeA

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331 [5].

Table 7.1.22.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN HD-FDD Cat-M2 UE under CEModeA

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331 [5].			

For parameters specified in Tables 7.1.22.5-1 and 7.1.22.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.26.2 in TS 36.133 [4].

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and Test 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.26.2 until the UE transmit timing offset is within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.22.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.22.5-4: Test requirement for T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
A	5	$15*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.22.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.22.5-6.

Table 7.1.22.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	$18*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.22.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	$18.6*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.23 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for CE UE in CEModeA

7.1.23.1 Test purpose

To verify that the CE UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.23.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 14 and forward of UE category M2 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.1.23.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.21.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.26 and A.7.1.23.

7.1.23.4 Test description

7.1.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.23.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the SRS, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.23.5-1, 7.1.23.5-2 and 7.1.23.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is 624× T_S to within the limits specified in Table 7.1.23.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 μs) for Test 1 and Test2 and to a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.23.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.23.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.23.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.23.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.23.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.
11. Repeat step 1-10 for each sub-test in Tables 7.1.23.5-1, 7.1.23.5-2 and 7.1.23.5-3 as appropriate.

7.1.23.4.3 Message contents

Same message contents as defined in clause 7.1.12.4.3.

7.1.23.5 Test requirement

Tables 7.1.23.5-1, 7.1.23.5-2 and 7.1.23.5-3 define the primary settings including test tolerances for E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA test.

Tables 7.1.23.5-4, 7.1.23.5-5 and 7.1.23.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.23.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Cat-M2 UE under CEModeA

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
Special subframe configuration[Note1]		6	6	6
Uplink-downlink configuration[Note2]		1	1	1
DRX cycle	ms	N/A	80[Note7]	640[Note7]
PRACH configuration		PRACH_4CE As specified in A.9		
MPDCCH Reference measurement channel[Note3]		R.14 TDD	R.14 TDD	R.14 TDD
OCNG Pattern[Note4]		OP.11 TDD	OP.11 TDD	OP.11 TDD
PBCH_RA	dB	0	0	0
PBCH_RB		0	0	0
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note5]				
OCNG_RB[Note5]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see Annex A.7.
Note 4: For the OCNG pattern, see Annex D.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table A.7.1.23.5-3.

Table 7.1.23.5-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD Cat-M2 UE under CEModeA

Field	Values			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
Duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	325	SRS periodicity of 10, 80, and 320 ms for Test 1, 2, and 3, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Table 7.1.23.5-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN TDD Cat-M2 UE under CEModeA

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	Sf640	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

For parameters specified in Tables 7.1.23.5-1 and 7.1.23.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.26.2 in TS 36.133 [4].

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.26.2 in TS 36.133 [4] until the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for test 2 and test 3.

d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624)\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.23.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.23.5-4: Test requirement for T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
A	5	$15*T_S$
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.23.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.23.5-6.

Table 7.1.23.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.23.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198ms
A	18.6*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.24 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeB

7.1.24.1 Test purpose

To verify that the CE UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.24.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 14 and forward of UE category M2 and higher, including non-BL/CE UE. Applicability requires support for CEModeB and FGI bit 5.

7.1.24.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.26.2 and shown in table 7.1.24.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.24.3-1: T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
B	1.4	48*Ts
B	5	40*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.24.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.26.2 and shown in table 7.1.24.3-2.

Table 7.1.24.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.26 and A.7.1.24.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.24.4 Test description

7.1.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.24.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.24.5-1 and 7.1.24.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.24.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of + 64 × T_S (approximately +2 μs) for Test 1 and Test2 and to and a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.24.5. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.24.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.24.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.24.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.24.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.24.5-1 and 7.1.24.5-2 as appropriate.

7.1.24.4.3 Message contents

Same message contents as defined in clause 7.1.14.4.3.

7.1.24.5 Test requirement

Tables 7.1.24.5-1 and 7.1.24.5-2 define the primary settings including test tolerances for E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeB test.

Tables 7.1.24.5-3, 7.1.24.5-4 and 7.1.24.5-5 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.24.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD Cat-M2 UE under CEModeB

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
DRX cycle		ms	N/A	80[Note5]	640[Note5]
MPDCCH Reference measurement channel[Note1]			R.18 FDD	R.18 FDD	R.18 FDD
OCNG Pattern[Note2]			OP.21 FDD	OP.21 FDD	OP.21 FDD
Number of repetitions	MPDCCH		128		
	PUSCH		32		
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$		dB	-11.7	-11.7	-11.7
$\hat{E}_s / N_{oc}$		dB	-11.7	11.7	-11.7
Io[Note4]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see Annex A.7.
Note 2: For the OCNG pattern, see Annex D.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table A.7.1.24.5-2.

Table 7.1.24.5-2: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN FDD Cat-M2 UE under CEModeB

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

For parameters specified in Tables 7.1.24.5-1 and 7.1.24.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.26.2 in TS 36.133 [4]. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 43 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +64×T_S (for Test 1 and Test 2) or +32×T_S (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.26.2 in TS 36.133 [4] until the UE transmit timing offset is within N_{TA}×T_S ± 43×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± 43×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.24.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})\times T_s$.

Table 7.1.24.5-3: Test requirement for T_e Timing Error Limit

CE Mode	Downlink Bandwidth (MHz)	$T_{e\_}$
B	1.4	51*Ts
B	5	43*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.		

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.24.5-4

2) The minimum aggregate adjustment rate shall be 3.4*T_S per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.24.5-5.

Table 7.1.14.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	18*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.14.5-5: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198 ms[3]
B	18.6*T_S(f > 1 GHz) 19.2*T_S(f ≤ 1 GHz)
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth. NOTE 3: The maximum adjustment rate requirement depends on the frequency of the operating band under test.	

7.1.27 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage

7.1.27.1 Test purpose

To verify that the Category NB1 UE under normal coverage is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits.

7.1.27.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2.

7.1.27.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 7.1.17.3.

7.1.27.4 Test description

7.1.27.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.1.27.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set according to Table 7.1.27.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA TDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.27.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value	Comment
		Test 1	
NB-IoT Operation mode		In-band	
DRX		OFF	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.21 [16]1
NPRACH configuration		NPRACH.R-2	As specified in A.3.18
NPDCCH repetition level		1	
npdcch-StartSF-USS Note 1		v8	
npdcch-NumRepetitions-r13 Note 1		r1	
NPUSCH repetition level		1	
Note 1: For further information see clause 6.7.3.2 in TS 36.331 [2].			

7.1.27.4.2 Test procedure

Same test procedure as in clause 7.1.17.4.2.

7.1.27.4.3 Message contents

Same message contents as in clause 7.1.17.4.3.

7.1.27.5 Test requirement

Tables 7.1.27.5-1, 7.1.27.5-2 define the primary settings of Ncell and Cell for UE transmit timing accuracy for TDD Category NB1 UE transmit timing accuracy test.

Table 7.1.27.5-3 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.27.5-1: nCell specific Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
RF Channel Number		1
$BW_{channel}$	kHz	200
PRB location within eCell		eCell $BW_{channel}$ 10MHz:30
NPDSCH parameter		eCell $BW_{channel}$ 10MHz: R.15 NB-TDD
NPDCCH parameter		eCell $BW_{channel}$ 10MHz: R.29 NB-TDD
NPBCH_RA	dB	-3
NPBCH_RB		
NPSS_RA		
NSSS_RA		
NPDCCH_RA		
NPDCCH_RB		
NPDSCH_RA		
NPDSCH_RB		
NOCNG_RA Note1		
NOCNG_RB Note1		
N_{oc}	dBm/15 kHz	Specified in Table 7.1.27.5-2
$\hat{E}_s / I_{ot}$	dB	4.3
$\hat{E}_s / N_{oc}$	dB	4.3
Antenna Configuration		2x1
Propagation condition	-	AWGN
Note 1 NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 7.1.27.5-2: eCell specific Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1

E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	10
NOCNG Pattern	-	$BW_{channel}$ 10MHz: NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB		
PSS_RA		
SSS_RA		
PCFICH_RB		
PHICH_RA		
PHICH_RB		
PDCCH_RA		
PDCCH_RB		
OCNG_RA Note1		
OCNG_RB Note1		
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	4
Antenna configuration		2x1
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

The UE transmit timing offset shall be within the requirements in Table 7.1.27.5-3.

Table 7.1.27.5-3: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	83*T_S
Note 1: T_S is the basic timing unit defined in TS 36.211	

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow three rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be 58.83*T_S seconds.

2) The minimum aggregate adjustment rate shall be 3.4*TS per 1008ms for carrier frequency under 1 GHz or 0.4*TS per 1008ms for carrier frequency over 1 GHz.

3) The maximum aggregate adjustment rate shall be 59.43*T_S per 192ms for carrier frequency under 1 GHz or 60.03*T_S per 192ms for carrier frequency over 1 GHz.7.1.28 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage

7.1.28.1 Test purpose

To verify that the Category NB1 UE under enhanced coverage is capable of following the frame timing change of the connected eNode B, that the UE initial transmit timing accuracy is within the specified limits and that the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission.

7.1.28.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2.

7.1.28.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 7.1.18.3.

7.1.28.4 Test description

7.1.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: EUTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 7.1.28.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set according to Table 7.1.28.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA TDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.28.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
NB-IoT Operation mode		In-band	In-band
DRX		OFF	ON
Special subframe configuration		6	
Uplink-downlink configuration		1	
NPRACH configuration		NPRACH.R-2	
NPDCCH repetition level		32	32
npdcch-StartSF-USS Note 2		v2	v2
npdcch-NumRepetitions-r13 Note 2		r32	r32
NPUSCH resource units		1	1
NPUSCH repetition level		128	128
NPUSCH subcarrier spacing	kHz	15	15
NPUSCH number of subcarriers		1	1
NPUSCH modulation		π /4QPSK	π /4QPSK
NPUSCH Transport block size	Bits	40	40
Note 1: DRX related parameters are defined in Table A.7.1.28.1-4. Note 2: For further information see clause 6.7.3.2 in TS 36.331 [2].			

7.1.28.4.2 Test procedure

Same test procedure as in clause 7.1.18.4.2.

7.1.28.4.3 Message contents

Same message contents as in clause 7.1.18.4.3.

7.1.28.5 Test requirement

Tables 7.1.28.5-1, 7.1.28.5-2 and 7.1.28.5-3 define the primary settings of Ncell and Cell for UE transmit timing accuracy for TDD Category NB1 UE transmit timing accuracy test.

Table 7.1.18.5-4 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.28.5-1: nCell specific Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
RF Channel Number		1	1
$BW_{channel}$	kHz	200	200
PRB location within eCell		eCell1 $BW_{channel}$ 10MHz: 30	eCell1 $BW_{channel}$ 10MHz: 30
NPDSCH parameter		eCell1 $BW_{channel}$ 10MHz: R.15 NB-TDD	eCell1 $BW_{channel}$ 10MHz: R.15 NB-TDD
NPDCCH parameter		eCell1 $BW_{channel}$ 10MHz:R.29 NB-TDD	eCell1 $BW_{channel}$ 10MHz: R.29 NB-TDD
NPBCH_RA	dB	-3	-3
NPBCH_RB			
NPSS_RA			
NSSS_RA			
NPDCCH_RA			
NPDCCH_RB			
NPDSCH_RA			
NPDSCH_RB			
NOCNG_RA Note1			
NOCNG_RB Note1			
N_{oc}	dBm/15 kHz	Specified in Table 7.1.28.5-2	Specified in Table 7.1.28.5-2
$\hat{E}_s/I_{ot}$	dB	-10.7	-10.7
$\hat{E}_s/N_{oc}$	dB	-10.7	-10.7
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1: NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.28.5-2: eCell specific Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2

E-UTRA RF Channel Number		1	1
$BW_{channel}$	MHz	10	10
NOCNG pattern		$BW_{channel}$ 10MHz: NOP.1 TDD	$BW_{channel}$ 10MHz: NOP.1 TDD
PBCH_RA	dB	-3	-3
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc}	dBm/15 kHz	-98	-98
$\hat{E}_s / N_{oc}$	dB	-11	-11
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.28.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD Category NB1 UE In-band mode under enhanced coverage

Field	Value	Comment
	Test 2	
onDurationTimer	pp1	
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
longDRX-CycleStartOffset	sf2048	
shortDRX	disable	
Note 1: For further information see clause 6.7.3 in TS 36.331 [2].		

The UE transmit timing offset shall be within the requirements in Table 7.1.28.5-4. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH transmission.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.18.5-4: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	$83*T_S$
Note 1: T_S is the basic timing unit defined in TS 36.211	

7.2 UE Timing Advance

7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy

7.2.1.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment requirements in an AWGN model.

7.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.2.1.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.1.

7.2.1.4 Test description

7.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set according to Table 7.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.1.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Tables 7.2.1.5-1 and 7.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be N_{TA} = 0.
6. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be N_{TA} = 128.
9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to ± 4.5 × T_S to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to ± 4.5 × T_S to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.1.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.1.4.3-3: *SoundingRSUL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		

7.2.1.5 Test requirement

Tables 7.2.1.4.1-1, 7.2.1.5-1 and 7.2.1.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test.

Table 7.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.1.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test case

Field	Value	Comment
srs-BandwidthConfig	bw5	
srs-SubframeConfig	sc3	Once every 5 subframes
ackNackSRS-SimultaneousTransmission	FALSE	
srsMaxUpPts	N/A	Not applicable for E-UTRAN FDD
srs-Bandwidth	0	No hopping
srs-HoppingBandwidth	hbw0	
freqDomainPosition	0	
duration	TRUE	Indefinite duration
srs-ConfigIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [15].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.1_2 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy for UE category 1bis

7.2.1_2.1 Test purpose

Same test purpose as in clause 7.2.1.1

7.2.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

7.2.1_2.3 Minimum conformance requirements

Same minimum conformance requirement as 7.2.1.3

7.2.1_2.4 Test description

7.2.1_2.4.1 Initial conditions

Same as in Clause 7.2.1.4.1 with the following exceptions:

- Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

7.2.1_2.4.2 Test procedure

Same as in Clause 7.2.1.4.2.

7.2.1_2.4.3 Message contents

Same as in Clause 7.2.1.4.3.

7.2.1_2.5 Test requirement

Same as in Clause 7.2.1.5.

7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy

7.2.2.1 Test purpose

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, in an AWGN model.

7.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.2.2.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.2.

7.2.2.4 Test description

7.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set according to Table 7.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.2.4-1 General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.2.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing

advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Tables 7.2.2.5-1, 7.2.2.5-2 and 7.2.2.5-3. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
6. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.
9. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
10. The timing of the first SRS transmission after sub-frame n+6 and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.2.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.2.2.4.3-3: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	15	SRS periodicity of 10	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	infinity		

7.2.2.5 Test requirement

Tables 7.2.2.4.1-1, 7.2.2.5-1 and 7.2.2.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test.

Table 7.2.2.5-1 Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note2]		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note3]	dB		
OCNG_RB[Note3]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io[Note4]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.2.5-2: Sounding Reference Signal Configuration for E-UTRAN TDD Transmit Timing Accuracy Test

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.2_2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy for UE category 1bis

7.2.2_2.1 Test purpose

Same test purpose as in clause 7.2.2.1

7.2.2_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis.

7.2.2_2.3 Minimum conformance requirements

Same minimum conformance requirement as 7.2.2.3

7.2.2_2.4 Test description

7.2.2_2.4.1 Initial conditions

Same as in Clause 7.2.2.4.1 with the following exceptions:

- Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

7.2.2_2.4.2 Test procedure

Same as in Clause 7.2.2.4.2.

7.2.2_2.4.3 Message contents

Same as in Clause 7.2.2.4.3.

7.2.2_2.5 Test requirement

Same as in Clause 7.2.2.5.

7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth

7.2.3.1 Test purpose

Same test purpose as defined in clause 7.2.1.1.

7.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N.

7.2.3.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.1.3 with the following exceptions:

- Instead of A.7.2.1 → use A.7.2.3.

7.2.3.4 Test description

7.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. The general test parameter settings are set according to Table 7.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.3.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Note 1: For the reference measurement channels, see clause A.1.1 and A.2.1. Note 2: See Table 7.2.1.4.1-1 for the ther parameters. Note 3: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2			

7.2.3.4.2 Test procedure

Same test procedure as defined in clause 7.2.1.4.2 with the following exceptions:

- Instead of Table 7.2.1.5-1 → use Table 7.2.3.5-1.

7.2.3.4.3 Message contents

Same message contents as defined in clause 7.2.1.4.3.

7.2.3.5 Test requirement

Same test requirement as defined in clause 7.2.1.5 with the following exceptions:

Tables 7.2.3.4.1-1, 7.2.3.5-1 and 7.2.1.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test for 5MHz bandwidth.

Table 7.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy for 5MHz bandwidth test case

Parameter	Unit	Value	
		T1	T2
$BW_{channel}$	MHz	5	
OCNG Patterns defined in D.1.15 (OP.15 FDD)		OP.15 FDD	
Io^{Note2}	dBm/4.5 MHz	-68.5	
Note 1: For the reference measurement channels, see clause A.2.1. Note 2: See Table 7.2.1.5-1 for the other parameters.			

7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG

7.2.4.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment accuracy requirements in an AWGN model.

7.2.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.4.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a TAG indicates N_{TA} values by index values of $T_A = 0, 1, 2, ..., 1282$, where an amount of the time alignment for the TAG is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, for a TAG indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of $T_A = 0, 1, 2,..., 63$, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing for the TAG by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.4.

7.2.4.4 Test description

7.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. The general test parameter settings are set according to Table 7.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Two Cells are used. Cell 1 is PCell on the primary component carrier; Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.2.4.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.4.4.2 Test procedure

The test consists of two cells. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Tables 7.2.4.5-1 and 7.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. SS shall transmit one message with a Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 31 which indicate zero adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

10. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.4.5-1.

11. SS shall transmit a sequence of messages with Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

12. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

13. The result from the SRS and adjustment of the timing advance in step 12) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.0 \times T_S$ +TT to the signalled timing advance value compared to the timing of preceding uplink transmission.

14. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

15. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

16. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat step 2-16 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.4.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table7.2.4.4.3-2: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {			
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.2.4.4.3-3: *SCellToAddMod-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.2.4.4.3-4: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.2.4.4.3-5: *RadioResourceConfigDedicatedSCell-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.2.4.4.3-6: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.2.4.5 Test requirement

Tables 7.2.4.4.1-1, 7.2.4.5-1 and 7.2.4.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG.

Table 7.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value			
		Cell1		Cell2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Active PCell		Cell1	Cell1		
Active SCell				Cell2	Cell2
TAG configuration		pTAG	pTAG	sTAG	sTAG
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note1]	dB				
OCNG_RB[Note1]	dB				
Timing Advance Command (T_A)		/	/	31	39
$\hat{E}_s / I_{ot}$	dB	3		3	
N_{oc}	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	3		3	
Io[Note2]	dBm/9 MHz	-65.5		-65.5	
Propagation Condition		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.4.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG

7.2.5.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment accuracy requirements in an AWGN model.

7.2.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a TAG indicates N_{TA} values by index values of $T_A = 0, 1, 2, ..., 1282$, where an amount of the time alignment for the TAG is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, for a TAG indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of $T_A = 0, 1, 2,..., 63$, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing for the TAG by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5.

7.2.5.4 Test description

7.2.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.

2. The general test parameter settings are set according to Table 7.2.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Two Cells are used. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.2.5.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5.4.2 Test procedure

The test consists of two cells. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Tables 7.2.5.5-1 and 7.2.5.5-2. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. SS shall transmit one message with a Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 31 which indicate zero adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T1 shall be N_{TA} = 0.
9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.5.5-1.
11. SS shall transmit a sequence of messages with Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T2 shall be N_{TA} = 128.

12. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

13. The result from the SRS and adjustment of the timing advance in step 12) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

14. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

15. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

16. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat step 2-16 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.5.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table7.2.5.4.3-2: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {			
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.2.5.4.3-3: *SCellToAddMod-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.2.5.4.3-4: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.2.5.4.3-5: *RadioResourceConfigDedicatedSCell-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.2.5.4.3-6: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	15		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.2.5.5 Test requirement

Tables 7.2.5.4.1-1, 7.2.5.5-1 and 7.2.5.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG.

Table 7.2.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	10	10
Active PCell		Cell1	
Active SCell			Cell2
TAG configuration		pTAG	sTAG
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note2]		1	1
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	OP.1 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note3]	dB		
OCNG_RB[Note3]	dB		
Timing Advance Command (T_A)			31 / 39
$\hat{E}_s / I_{ot}$	dB	3	3
N_{oc}	dBm/15 KHz	-98	-98
$\hat{E}_s / N_{oc}$	dB	3	3
Io[Note4]	dBm/9 MHz	-65.5	-65.5
Propagation Condition		AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.5.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth

7.2.5A.1 Test purpose

Same test purpose as defined in clause 7.2.5.1.

7.2.5A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.2.5.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5A.

7.2.5A.4 Test description

7.2.5A.4.1 Initial conditions

Same initial conditions as in clause 7.2.5.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- Instead of table 7.2.5.4.1-1, use table 7.2.5A.4.1-1.

Table 7.2.5A.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5A.4.2 Test procedure

Same test procedure as in clause 7.2.5.4.2

7.2.5A.4.3 Message contents

Same message contents as in clause 7.2.5.4.3

7.2.5A.5 Test requirement

Table 7.2.5A.4.1-1, 7.2.5A.5-1 and 7.2.5A.5-2 define the primary level settings. The listed parameter values in Table 7.2.5A.5-1 will replace the values of corresponding parameters in Table 7.2.5.5-1 other parameters keep the same.

Table 7.2.5A.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2
$BW_{channel}$	MHz	20		20	
OCNG Patterns defined in D.2.7		OP.7 TDD		OP.7 TDD	
Io^{Note4}	dBm/18 MHz	-62.5		-62.5	

Table 7.2.5A.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth

7.2.5B.1 Test purpose

Same test purpose as defined in clause 7.2.5.1.

7.2.5B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5B.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.2.5.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5B.

7.2.5B.4 Test description

7.2.5B.4.1 Initial conditions

Same initial conditions as in clause 7.2.5.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for PCell and 10 MHz for SCell
- Instead of table 7.2.5.4.1-1, use table 7.2.5B.4.1-1.

Table 7.2.5B.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		For Cell 1: DL Reference Measurement Channel R.3 TDD For Cell 2: DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		For Cell 1: DL Reference Measurement Channel R.10 TDD For Cell 2: DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5B.4.2 Test procedure

Same test procedure as in clause 7.2.5.4.2

7.2.5B.4.3 Message contents

Same message contents as in clause 7.2.5.4.3

7.2.5B.5 Test requirement

Table 7.2.5B.4.1-1, 7.2.5B.5-1 and 7.2.5B.5-2 define the primary level settings. The listed parameter values in Table 7.2.5B.5-1 will replace the values of corresponding parameters in Table 7.2.5.5-1 other parameters keep the same.

Table 7.2.5B.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2

$BW_{channel}$	MHz	20	10
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.7 (OP.7 TDD)		OP.7 TDD	OP.1 TDD
Io^{Note4}	dBm/18 MHz	-62.5	N/A
	dBm/9 MHz	N/A	-65.5

Table 7.2.5B.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

7.2.6.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment accuracy requirements for CE UE in CEModeA in an AWGN model.

7.2.6.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.2.6.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a cell indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment for the cell is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.6.

7.2.6.4 Test description

7.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.6.4.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

PDSCH parameters: DL Reference Measurement Channel		R.20 FDD	As specified in clause A.8.1
MPDCCH parameters: DL Reference Measurement Channel		R.16 FDD	As specified in clause A.7.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.6.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (*timeAlignmentTimer* IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Tables 7.2.6.5-1 and 7.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an *RRCConnectionReconfiguration* message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. SS shall transmit one message with a Timing Advance Command, T_A. This message shall be transmitted only at an ODD downlink frame of Cell 1. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

6. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.6.5-1.

8. SS shall transmit a sequence of messages with Timing Advance Command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. The SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including *PagingRecord* with *ue-Identity*) for the UE and ensures the UE is in State 3A-CE according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA),

or

    - switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.6.4.3-1: Common Exception messages for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.4-2 Table H.7.1-1

Table 7.2.6.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.6.4.3-3: *SoundingRSUL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw1		
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	17	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.6.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		

7.2.6.5 Test requirement

Tables 7.2.6.4.1-1, 7.2.6.5-1 and 7.2.6.5-2 define the primary level settings for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA.

Table 7.2.6.5-1: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.1		R.20 FDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.1		R.16 FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io[Note2]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cells is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.6.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	17	SRS periodicity of 20.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331.

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

7.2.7.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN HD-FDD UE timing advance adjustment accuracy requirements for CE UE in CEModeA in an AWGN model.

7.2.7.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.2.7.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.6.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.7.

7.2.7.4 Test description

7.2.7.4.1 Initial conditions

Same initial conditions as in clause 7.2.6.4.1 with following exceptions:

- Instead of Table 7.2.6.4.1-1 → use Table 7.2.7.4.1-1.

Table 7.2.7.4.1-1: General Test Parameters for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Parameter	Unit	Value	Comment
PDSCH parameters: DL Reference Measurement Channel		R.10 HD-FDD	As specified in clause A.8.2
MPDCCH parameters: DL Reference Measurement Channel		R.6 HD-FDD	As specified in clause A.7.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.7.4.2 Test procedure

Same test procedure as in clause 7.2.6.4.2 with following exceptions:

- Instead of Tables 7.2.6.5-1 → use Table 7.2.7.5-1.
- Instead of Table 7.2.6.5-2 → use Table 7.2.7.5-2.

7.2.7.4.3 Message contents

Same message contents as in clause 7.2.6.4.3.

7.2.7.5 Test requirement

Tables 7.2.7.4.1-1, 7.2.7.5-1 and 7.2.7.5-2 define the primary level settings for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA.

Table 7.2.7.5-1: Cell specific Test Parameters for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.2		R.10 HD-FDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.2		R.6 HD-FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.7.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	17	SRS periodicity of 20.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note 1: For further information see clause 6.3.2 in TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

7.2.8.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment accuracy requirements for CE UE in CEModeA in an AWGN model.

7.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.2.8.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.6.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.8.

7.2.8.4 Test description

7.2.8.4.1 Initial conditions

Same initial conditions as in clause 7.2.6.4.1 with following exceptions:

- Instead of Table 7.2.6.4.1-1 → use Table 7.2.8.4.1-1.

Table 7.2.8.4.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

PDSCH parameters: DL Reference Measurement Channel		R.16 TDD	As specified in clause A.8.3
MPDCCH parameters: DL Reference Measurement Channel		R.14 TDD	As specified in clause A.7.3
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.8.4.2 Test procedure

Same test procedure as in clause 7.2.6.4.2 with following exceptions:

- Instead of Tables 7.2.6.5-1 → use Table 7.2.8.5-1.
- Instead of Table 7.2.6.5-2 → use Table 7.2.8.5-1.

7.2.8.4.3 Message contents

Same message contents as in clause 7.2.6.4.3 with condition TDD.

7.2.8.5 Test requirement

Tables 7.2.8.4.1-1, 7.2.8.5-1 and 7.2.8.5-2 define the primary level settings for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA.

Table 7.2.8.5-1: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.3		R.16 TDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.3		R.14 TDD	
OCNG Patterns defined in clause D.2		OP.11 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io[Note2]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cells is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.8.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN TDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN TDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331.

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.9 HD-FDD UE Timing Advance Adjustment Accuracy Test for Category NB1 UE in Standalone Mode under Enhance Coverage

7.2.9.1 Test Purpose

The purpose of the test is to verify E-UTRAN Timing Advance adjustment accuracy requirements for category NB1 UE in enhanced coverage in an AWGN model.

7.2.9.2 Test applicability

This test applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

7.2.9.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance, see TS 36.321 [17] clause 5.2.

UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+12 for a timing advance command received in sub-frame *n*. In case repetitions are used on the downlink, sub-frame *n* refers to the last subframe in the repetition period in which the message containing the MAC control information was received. The UE shall not apply a TA command during an uplink repetition period.

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 13.33 * T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiples of $16 * T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 16.1.2. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 16.1.2. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.21.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.22 and A.7.2.9.

7.2.9.4 Test description

7.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table Annex E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: 200 KHz.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set according to Table 7.2.9.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.9.4.1-1: General Test Parameters for E-UTRAN Timing Advance Accuracy Test for Category NB1 UE in Standalone Mode under Enhanced Coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			Standalone	
CP Length			Normal	
Timing Advance Command (T_A) value during T1			31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2			39	N_{TA} = 128
Number of repetitions	NPDCCH		128	
	NPDSCH		128	
	NPUSCH		32	
DRX			OFF	
T1		s	5	
T2		s	5	

7.2.9.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and the UE is scheduled in uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to T1 in Tables 7.2.9.5-1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS sends uplink scheduling information via NPDCCH DCI format N1 for C_RNTI to schedule uplink subframes according to TS 36.508 [7] clause 8.1.3.6, Table 8.1.3.6.1.2-2.

4. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

5. The UE shall transmit NPUSCH (NPUSCH Format 2 is used to carry ACK/NACK) and adjust its uplink timing at the beginning of sub-frame n+12 for a timing advance command T_A received in sub-frame n. Sub-frame n is the last subframe in the repetition period of NPDSCH in which the timing advance command is received by the UE.

6. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.9.5-1.

7. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

8. The UE shall transmit NPUSCH (NPUSCH Format 2 is used to carry ACK/NACK) and adjust its uplink timing at the beginning of sub-frame n+12 for a timing advance command T_A received in sub-frame n. Sub-frame n is the last subframe in the repetition period of NPDSCH in which the timing advance command is received by the UE.

9. The result from the NPUSCH and adjustment of the timing advance in step 8) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 13.83 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

10. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 13.83 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. The SS shall transmit RRCConnectionRelease-NB message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. After the RRC connection release, the SS:

    - transmits in Ncell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 (if the paging fails, switches off and on the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5),

    or

    - switches off and on the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions.

Table 7.2.9.4.3-1: NPDCCH-ConfigDedicated-NB-DEFAULT

Derivation Path: 36.331 clause 6.7.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDCCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
npdcch-NumRepetitions-r13	r128		
npdcch-StartSF-USS-r13	V2		
npdcch-Offset-USS-r13	zero		
}			

Table 7.2.9.4.3-2: NB-IoT Physical layer parameters for DCI format N1

Parameter	Value	Value in binary
Repetition number	NRep = 128	“0111”
DCI subframe repetition number	R = 128	“11”

Table 7.2.9.4.3-3: NPUSCH-ConfigDedicated-NB-DEFAULT

Derivation Path: 36.331 clause 6.7.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NPUSCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
ack-NACK-NumRepetitions-r13	r32		
}			

7.2.9.5 Test requirement

Tables 7.2.9.4.1-1, 7.2.9.5-1 and 7.2.9.5-2 define the primary level settings for HD-FDD UE timing advance adjustment accuracy test.

Table 7.2.9.5-1: Cell specific Test Parameters for E-UTRAN Timing Advance Accuracy Test for Category NB1 UE in Standalone Mode under Enhanced Coverage

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	kHz	200	
NPDSCH parameters: DL Reference Measurement Channel defined in A.10.2		R.18 HD-FDD	
NPDCCH parameters: DL Reference Measurement Channel defined in A.10.1		R.30 HD-FDD	
NOCNG Patterns defined in D.3		NOP.3 FDD	
NPBCH_RA	dB	0	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA[Note1]	dB		
NOCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	-12	
N_{oc}	dBm/15 KHz	-88	
$\hat{E}_s / N_{oc}$	dB	-12	
Io[Note2]	dBm/ 180 KHz	-76.9	
Antenna Configuration		1x1	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

The UE shall apply the signalled Timing Advance value to the transmission timing at subframe n+12, where subframe n is the last subframe in the repetition period of NPDSCH in which the timing advance command is received by the UE.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 13.83 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.10 E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

7.2.10.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment accuracy requirements for CE UE in CEModeB in an AWGN model.

7.2.10.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

7.2.10.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a cell indicates N_{TA} values by index values of $T_A = 0, 1, 2, ..., 1282$, where an amount of the time alignment for the cell is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of $T_A = 0, 1, 2,..., 63$, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.10.

7.2.10.4 Test description

7.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.10.4.1-1: General Test Parameters for E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	Comment
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	
Number of repetitions of MPDCCH		128	
Number of repetitions of PUSCH		32	

7.2.10.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and PUSCH are sent from the UE and received by the SS. By measuring the reception of the PUSCH, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (*timeAlignmentTimer* IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Tables 7.2.10.5-1. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an *RRCConnectionReconfiguration* message.
4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.
5. SS shall transmit one message with a Timing Advance Command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
6. The UE shall transmit PUSCH and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.10.5-1.
8. SS shall transmit a sequence of messages with Timing Advance Command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.
9. The UE shall transmit PUSCH and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. The result from the PUSCH and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. The SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS:

- transmits in Cell 1 a Paging message (including *PagingRecord* with *ue-Identity*) for the UE and ensures the UE is in State 3A-CE according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),

or

- switches off and on the UE and ensures the UE is in State 3A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.10.4.3 Message contents

Table 7.2.10.4.3-1: Common Exception messages for E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.2.10.4.3-2: PUSCH-ConfigCommon-v1310-DEFAULT: Additional E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-10A PUSCH-ConfigCommon-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PUSCH-ConfigCommon-v1310-DEFAULT ::= SEQUENCE {			
pusch-maxNumRepetitionCEmodeB-r13	r192	Set to minimum value for CE Mode B	CEmodeB
pusch-HoppingOffset-v13xy	Not present	No PUSCH frequency hopping	
}			

7.2.10.5 Test requirement

Tables 7.2.10.4.1-1, 7.2.10.5-1 define the primary level settings for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeB.

Table 7.2.10.5-1: Cell specific Test Parameters for E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH Reference Measurement Channel in clause A.8.4		R.22 FDD	
MPDCCH Reference Measurement Channel in clause A.7.4		R.18 FDD	
OCNG Patterns defined in D.1		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	-12	
$\hat{E}_s / I_{ot}$ Note2	dB	-12	
RSRP Note2	dBm/15 KHz	-110	
Io Note2	dBm/9 MHz	-69.95	
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: OCNG shall be used such that cells is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: $\hat{E}_s / I_{ot}$, RSRP, Io level has been derived from other parameters for information purpose. It is not a settable parameter.

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

7.2.11 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

7.2.11.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN HD-FDD UE timing advance adjustment accuracy requirements for CE UE in CEModeB in an AWGN model.

7.2.11.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CE Mode B.

7.2.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.10.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.11.

7.2.11.4 Test description

7.2.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table A.7.2.11.4.1-1: General Test Parameters for E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	Comment
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	
Number of repetitions of MPDCCH		128	
Number of repetitions of PUSCH		32	

7.2.11.4.2 Test procedure

Same test procedure as in clause 7.2.10.4.2 with following exception:

- Instead of Table 7.2.10.5-1 → use Table 7.2.11.5-1.

7.2.11.4.3 Message contents

Same message contents as in clause 7.2.10.4.3.

7.2.11.5 Test requirement

Tables 7.2.11.4.1-1 and 7.2.11.5-1 define the primary level settings for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for CE UE in CEModeB.

Table 7.2.11.5-1: Cell specific Test Parameters for E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH Reference Measurement Channel defined in clause A.8.5		R.12 HD-FDD	
MPDCCH Reference Measurement Channel defined in clause A.7.5		R.8 HD-FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	-12	
$\hat{E}_s / I_{ot}$ Note2	dB	-12	
RSRP Note2	dBm/15 KHz	-110	
Io Note2	dBm/9 MHz	-69.95	
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: $\hat{E}_s / I_{ot}$, RSRP, Io level has been derived from other parameters for information purpose. It is not a settable parameter.

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

7.2.12 E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

7.2.12.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment accuracy requirements for CE UE in CEModeB in an AWGN model.

7.2.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEModeB.

7.2.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.10.3

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.12.

7.2.12.4 Test description

7.2.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.12.4.1-1: General Test Parameters for E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	Comment
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	
Number of repetitions of MPDCCH		128	
Number of repetitions of PUSCH		32	

7.2.12.4.2 Test procedure

Same test procedure as in clause 7.2.10.4.2 with following exception:

- Instead of Table 7.2.10.5-1 → use Table 7.2.12.5-1.

7.2.12.4.3 Message contents

Same message contents as in clause 7.2.10.4.3.

7.2.12.5 Test requirement

Tables 7.2.12.4.1-1 and 7.2.12.5-1 define the primary level settings for E-UTRAN TDD Timing Advance Adjustment Accuracy Test in CEModeB.

Table 7.2.12.5-1: Cell specific Test Parameters for E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test for CE UE in CEModeB

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH Reference Measurement Channel in clause A.8.6		R.18 TDD	
MPDCCH Reference Measurement Channel in clause A.7.6		R.16 TDD	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note2]		1	
OCNG Patterns defined in D.2		OP.11 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note3]	dB		
OCNG_RB[Note3]	dB		
Timing Advance Command (T_A)		31	39
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	-12	
$\hat{E}_s / I_{ot}$ [Note4]	dB	-12	
RSRP [Note4]	dBm/15 KHz	-110	
Io[Note4]	dBm/9 MHz	-69.95	
Propagation Condition		AWGN	
Antenna Configuration		1x1	

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: $\hat{E}_s / I_{ot}$, RSRP, Io level has been derived from other parameters for information purpose. It is not a settable parameter.

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

7.2.13 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for sTTI and ShortProcessingTime

7.2.13.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment requirements when *ShortTTI-r15* is configured or *ShortProcessingTime=TRUE* in an AWGN model.

7.2.13.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 15 supporting sTTI or short processing time.

7.2.13.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

When *ShortTTI*-r15 is not configured and *ShortProcessingTime=TRUE* , the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. When *dl-STTI-Length-r15*=slot, the UE adjusts its uplink timing at the first subframe boundary following *n+8* slot for a timing advance command received in slot n. When *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*= nplus4set1, the UE adjusts its uplink timing at the first subframe boundary following *n+16* subslot for a timing advance command received in subslot *n*. When *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*= nplus6set1 or

proc-Timeline-r15= nplus6set2, the UE adjusts its uplink timing at the first subframe boundary following n+18 subslot for a timing advance command received in subslot n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] Table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.13.

7.2.13.4 Test description

7.2.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set according to Table 7.2.13.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.13.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TRUE*

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel for FDD with slot duration TTI: R.8 FDD; DL Reference Measurement Channel for FDD with subslot duration TTI: R.9 FDD;	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Timing Advance Command (T_A) value		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.13.4.2 Test procedure

The test consists of a single cell. The test consists of 4 tests which apply to different UE capability in Table 7.2.13.4.2.1. Each test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 7.2.13.5-1 and 7.2.13.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

6. In test 1, the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. In test 2, the UE adjusts its uplink timing at the first subframe boundary following n+8 slot for a timing advance command received in slot n. In test 3, the UE adjusts its uplink timing at the first subframe boundary following n+16 subslot for a timing advance command received in subslot *n*. In test 4, the UE adjusts its uplink timing at the first subframe boundary following n+18 subslot for a timing advance command received in subslot n.

7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.13.5-1.

8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

9. In test 1, the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. In test 2, the UE adjusts its uplink timing at the first subframe boundary following n+8 slot for a timing advance command received in slot n. In test 3, the UE adjusts its uplink timing at the first subframe boundary following n+16 subslot for a timing advance command received in subslot *n*. In test 4, the UE adjusts its uplink timing at the first subframe boundary following n+18 subslot for a timing advance command received in subslot n.

10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

Table 7.2.13.4.2-1: 4 tests for different UE capability

Test ID	UE capability
1	Support of short processing time
2	Support of slot operation in downlink
3	Support of subslot operation in downlink and the minimum processing timeline belongs to Set 1
4	Support of subslot operation in downlink
NOTE:	For UEs supporting subslot operation in downlink, if the minimum processing timeline belongs to Set 1, both test 3 and test 4 are needed, otherwise only test 4 is needed

7.2.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.13.4.3-1: Common Exception messages for E-UTRAN FDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.13.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.13.4.3-3: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.13.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
shortTTI-AndSPT-r15 SEQUENCE {			
periodicBSR-Timer-r15	sf20		
proc-Timeline-r15	nplus4set1		test 3
	nplus6set2		test 4
}			
}			

Table 7.2.13.4.3-5: *PhysicalConfigDedicated-DEFAULT* for sTTI and *ShortProcessingTime=TRUE* (test 1, test 2, test 3 and test 4)

Derivation Path: 36.508 Table 4.8.2.1.6-1 with condition Short-TTI			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
PhysicalConfigDedicatedSTTI-r15 SEQUENCE {			
shortProcessingTime-r15	TRUE		test 1
shortTTI-r15 SEQUENCE {}	Not present		test 1
shortTTI-r15 SEQUENCE {			test 3 and test 4
dl-STTI-Length-r15	subslot		
ul-STTI-Length-r15	subslot		
}			
}			
}			

7.2.13.5 Test requirement

Tables 7.2.13.4.1-1, 7.2.13.5-1 and 7.2.13.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test for sTTI and *ShortProcessingTime=TRUE*.

Table 7.2.13.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TRUE*

Parameter	**Unit**	**Value**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.13.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TRUE*

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331.		

In test 1, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 5 sub frames after the reception of the timing advance command in sub-frame n.

In test 2, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. at the first subframe boundary following *8* slots after the reception of the timing advance command in slot *n*.

In test 3, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. at the first subframe boundary following 16 subslots after the reception of the timing advance command in subslot *n*.

In test 4, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. at the first subframe boundary following 18 subslots after the reception of the timing advance command in subslot *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.14 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for sTTI and ShortProcessingTime

7.2.14.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment requirements when *ShortTTI-r15* is configured or *ShortProcessingTime=TRUE* in an AWGN model.

7.2.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 supporting sTTI or short processing time.

7.2.14.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

When *ShortTTI*-r15 is not configured and *ShortProcessingTime=TRUE* , the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. When *dl-STTI-Length-r15*=slot, the UE adjusts its uplink timing at the first subframe boundary following *n+8* slot for a timing advance command received in slot n.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.14.

7.2.14.4 Test description

7.2.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set according to Table 7.2.14.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.14.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TR* *UE*Parameter	**Unit**	**Value**	**Comment**
PDSCH parameters		DL Reference Measurement Channel for TDD slot duration TTI: R.6 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Timing Advance Command (T_A) value		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.14.4.2 Test procedure

The test consists of 2 tests which apply to different UE capability in Table 7.2.14.4.2.1. Each test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Tables 7.2.14.5-1 and 7.2.14.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
6. In test 1, the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. In test 2, the UE adjusts its uplink timing at the first subframe boundary following n+8 slot for a timing advance command received in slot n.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.14.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.
9. In test 1, the UE adjusts its uplink timing at sub-frame n+5 for a timing advance command received in sub-frame n. In test 2, the UE adjusts its uplink timing at the first subframe boundary following n+8 slot for a timing advance command received in slot n.
10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

Table 7.2.14.4.2-1: 2 tests for different UE capability

Test ID	UE capability
1	Support of short processing time
2	Support of slot operation in downlink

7.2.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.14.4.3-1: Common Exception messages for E-UTRAN TDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.14.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			
}			

Table 7.2.14.4.3-3: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	TDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.14.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement for sTTI and *ShortProcessingTime=TRUE*

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 7.2.14.4.3-5: *PhysicalConfigDedicated-DEFAULT* for sTTI and *ShortProcessingTime=TRUE* (test1, test 2)

Derivation Path: 36.508 Table 4.8.2.1.6-1 with condition Short-TTI			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
PhysicalConfigDedicatedSTTI-r15 SEQUENCE {			
shortProcessingTime-r15	TRUE		test 1
shortTTI-r15 SEQUENCE {}	Not present		test 1
}			
}			

7.2.14.5 Test requirement

Tables 7.2.14.4.1-1, 7.2.14.5-1 and 7.2.14.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test for sTTI and *ShortProcessingTime=TRUE*.

Table 7.2.14.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TRUE*

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	3	
Io[Note2]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.2.14.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test case for sTTI and *ShortProcessingTime=TRUE*

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN TDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331.		

In test 1, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 5 sub frames after the reception of the timing advance command in sub-frame n.

In test 2, the UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. at the first subframe boundary following *8* slots after the reception of the timing advance command in slot *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.15 E-UTRAN TDD – TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage

7.2.15.1 Test purpose

The purpose of the test is to verify E-UTRAN Timing Advance adjustment accuracy requirements for category NB1 UE in enhanced coverage in an AWGN model.

7.2.15.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2.

7.2.15.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 7.2.9.3.

7.2.15.4 Test description

7.2.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table Annex E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: 200 KHz.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.2.15.4-1: General Test Parameters for E-UTRAN Timing Advance Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			Standalone	
CP Length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [16]
Timing Advance Command (T_A) value during T1			31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2			39	N_{TA} = 128
Number of repetitions	NPDCCH		128	
	NPDSCH		128	
	NPUSCH		32	
DRX			OFF	
T1		s	5	
T2		s	5	

7.2.15.4.2 Test procedure

Same test procedure as in clause 7.2.9.4.2.

7.2.15.4.3 Message contents

Same message contents as in clause 7.2.9.4.3.

7.2.15.5 Test requirement

Tables 7.2.15.4.1-1, 7.2.15.5-1 and 7.2.15.5-2 define the primary level settings for TDD UE timing advance adjustment accuracy test.

7.2.15.5-1: Cell specific Test Parameters for E-UTRAN Timing Advance Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage

Parameter	Unit	Value	
		T1	T2

E-UTRA RF Channel Number		1	
$BW_{channel}$	KHz	200	
NPDSCH parameters: DL Reference Measurement Channel defined in A.3.1.5.3		R.18 NB-TDD	
NPDCCH parameters: DL Reference Measurement Channel defined in A.3.1.6.3		R.30 NB-TDD	
NOCNG Patterns defined in A.3.2.3.3		NOP.3 TDD	
NPBCH_RA	dB	0	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA[Note1]	dB		
NOCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s / I_{ot}$	dB	-12	
N_{oc}	dBm/15 KHz	-88	
$\hat{E}_s / N_{oc}$	dB	-12	
Io[Note2]	dBm/ 180 KHz	-76.9	
Antenna Configuration		1x1	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

The UE shall apply the signalled Timing Advance value to the transmission timing at subframe n+12, where subframe n is the last subframe in the repetition period of NPDSCH in which the timing advance command is received by the UE.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 13.83 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.3 Radio Link Monitoring

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

7.3.1.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.1.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.1.

7.3.1.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.1.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

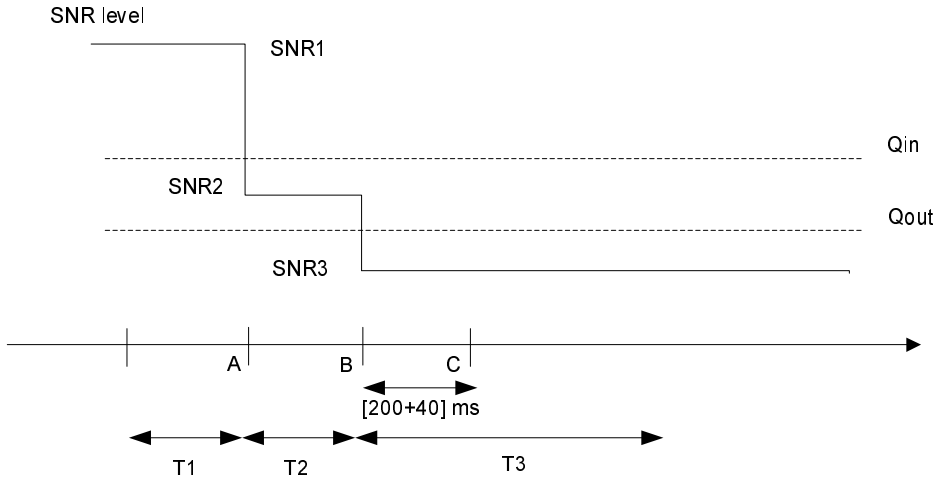

Figure 7.3.1.4-1: SNR variation for out-of-sync testing

7.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1:As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10

2. The general test parameter settings for the different subtests are set up according to Table 7.3.1.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.1.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	2	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.							

7.3.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.1.5-1 for subtest 1 and 2 and according to T1 in Table and 7.3.1.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.1.5-2 for subtests 3 and 4. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.1.5-2 for subtests 3 and 4. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and Table 7.3.1.5-2 for subtests 3 and 4.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.1.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.1.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.1.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync test 1 and 3 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.1.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.1.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.1.5 Test requirement

Table 7.3.1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x2			2x2		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-4.1	-8.9	-14.1	-4.3	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.

Table 7.3.1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-0.6	-4.7	-12.3	-1.4	-5.3	-13.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.1_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports

7.3.1_1.1 Test purpose

Same as 7.3.1.1.

7.3.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands.

7.3.1_1.3 Minimum conformance requirements

Same as 7.3.1.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.1.

7.3.1_1.4 Test description

Same as 7.3.1.4.

7.3.1_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.76 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.75
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.76
2. The general test parameter settings for the different subtests are set up according to Table 7.3.1_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.1_1.4.3.1
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.1_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.1.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4, instead of 2x2 use 2x4
- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.1_1.4.2 Test procedure

Same Test Procedure as in 7.3.1.4.2 with the following changes:

- Instead of Table 7.3.1.5-1 use Table 7.3.1_1.5-1
- Instead of Table 7.3.1.5-2 use Table 7.3.1_1.5-2

7.3.1_1.4.3 Message contents

Same as 7.3.1.4.3.

7.3.1_1.5 Test requirement

Table 7.3.1_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x4			2x4		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-4.1	-8.9	-17.6	-4.3	-8.9	-17.6
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.1_1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x4 Low			2x4 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-0.6	-4.7	-15.8	-1.4	-5.3	-16.6
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync

7.3.2.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.2.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.2.

7.3.2.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.2.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

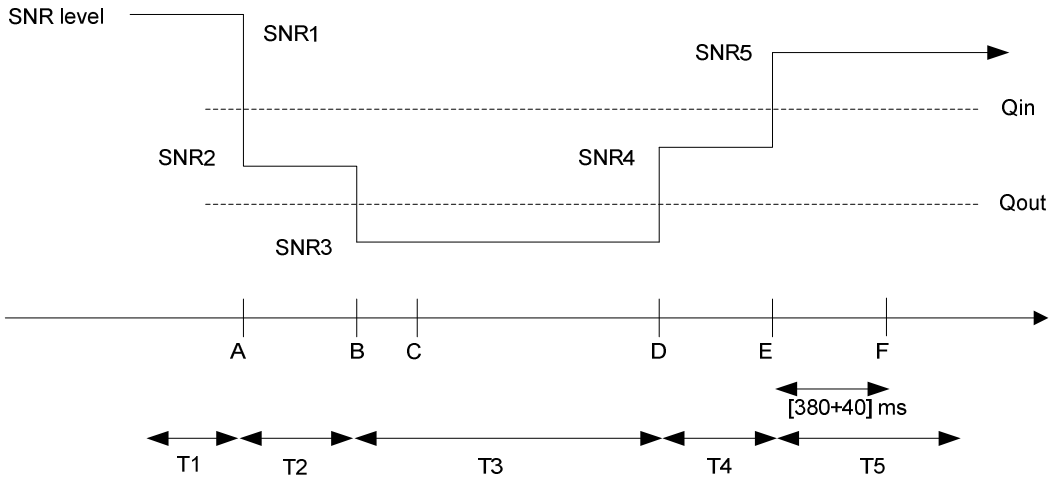

Figure 7.3.2.4-1: SNR variation for in-sync testing

7.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtest are set up according to Table 7.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.2.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.2.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	
DRX			OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	ETU 70 Hz	
T1		s	0.5	0.5	
T2		s	0.4	0.4	
T3		s	1.36	1.36	
T4		s	0.4	0.4	
T5		s	1	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.2.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.2.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.2.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.2.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.2.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.2.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.2.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.2.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync test 1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.2.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.2.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.2.5 Test requirement

Table 7.3.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD					OP.2 FDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.6	-4.7	-12.3	-7.2	-0.6	-1.4	-5.3	-13.1	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.2.4-1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.2_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports

7.3.2_1.1 Test purpose

Same as 7.3.2.1.

7.3.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands.

7.3.2_1.3 Minimum conformance requirements

Same as 7.3.2.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.2.

7.3.2_1.4 Test description

Same as 7.3.2.4.

7.3.2_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.76.

2. The general test parameter settings for the different subtest are set up according to Table 7.3.2_1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.2_1.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.2_1.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

See Table 7.3.2.4.1 with the following changes:

- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.2_1.4.2 Test procedure

Same Test Procedure as in 7.3.2.4.2 with the following changes:

- Instead of Table 7.3.2.5-1 use Table 7.3.2_1.5-1

7.3.2_1.4.3 Message contents

Same as 7.3.2.4.3.

7.3.2_1.5 Test requirement

Table 7.3.2_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x4 Low					2x4 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD					OP.2 FDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6 Note 7	dB	-0.6	-4.7	-14.8	-10.7	-0.6	-1.4	-5.3	-16.5	-11.6	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.2.4-1
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

7.3.3.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.3.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.3.

7.3.3.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.3.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

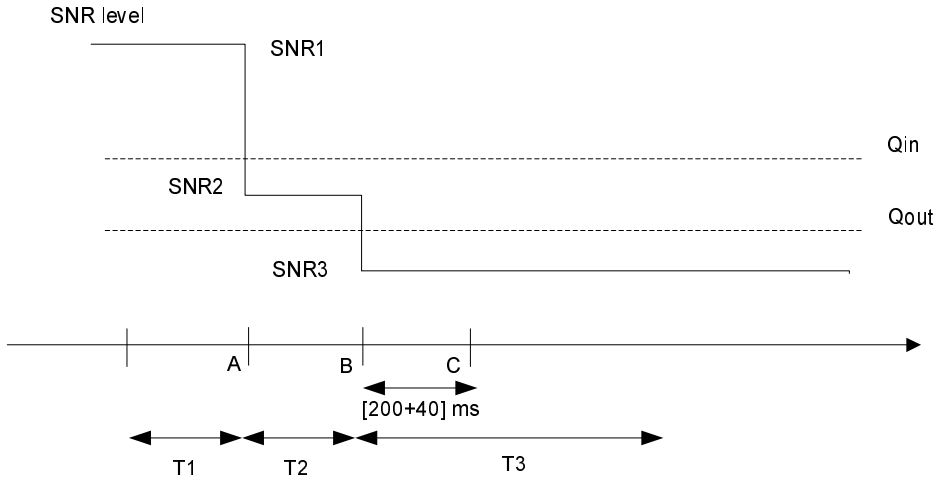

Figure 7.3.3.4-1: SNR variation for out-of-sync testing

7.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10

2. The general test parameter settings for the different subtests are set up according to Table 7.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.3.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.3.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	1	1	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel

7.3.3.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.3.5-1 for subtests 1 and 2 and according to T1 in Table and 7.3.3.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.3.5-2 for subtests 3 and 4. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.3.5-2 for subtests 3 and 4. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each uplink subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and Table 7.3.3.5-2 for subtests 3 and 4.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.3.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.3.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.3.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync test 1 and 3 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.3.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.3.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.3.5 Test requirement

Table 7.3.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x2			2x2		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 3]	dB						
OCNG_RB[Note 3]	dB						
SNR [Note 8]	dB	-4.5	-8.5	-13.7	-4.6	-8.6	-13.8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.

Table 7.3.3.5-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 3	dB						
OCNG_RB Note 3	dB						
SNR Note 8	dB	-0.6	-4.5	-12.1	-1.4	-5.0	-12.8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.3_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports

7.3.3_1.1 Test purpose

Same as 7.3.3.1.

7.3.3_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that supports 4Rx on all its TDD operating bands.

7.3.3_1.3 Minimum conformance requirements

Same as 7.3.3.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.3.

7.3.3_1.4 Test description

Same as 7.3.3.4.

7.3.3_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.76 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.75
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.76
2. The general test parameter settings for the different subtests are set up according to Table 7.3.3_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.3_1.4.3.1
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.3_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.3.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4, instead of 2x2 use 2x4
- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.3_1.4.2 Test procedure

Same Test Procedure as in 7.3.3.4.2 with the following changes:

- Instead of Table 7.3.3.5-1 use Table 7.3.3_1.5-1
- Instead of Table 7.3.3.5-2 use Table 7.3.3_1.5-2

7.3.3_1.4.3 Message contents

Same as 7.3.3.4.3.

7.3.3_1.5 Test requirement

Table 7.3.3_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x4			2x4		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-4.5	-8.5	-17.2	-4.6	-8.6	-17.3
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.3_1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x4 Low			2x4 Low		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.1 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-0.6	-4.5	-15.6	-1.4	-5.0	-16.3
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync

7.3.4.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.4.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.4.

7.3.4.4 Test description

The test consists of 2 subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.4.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

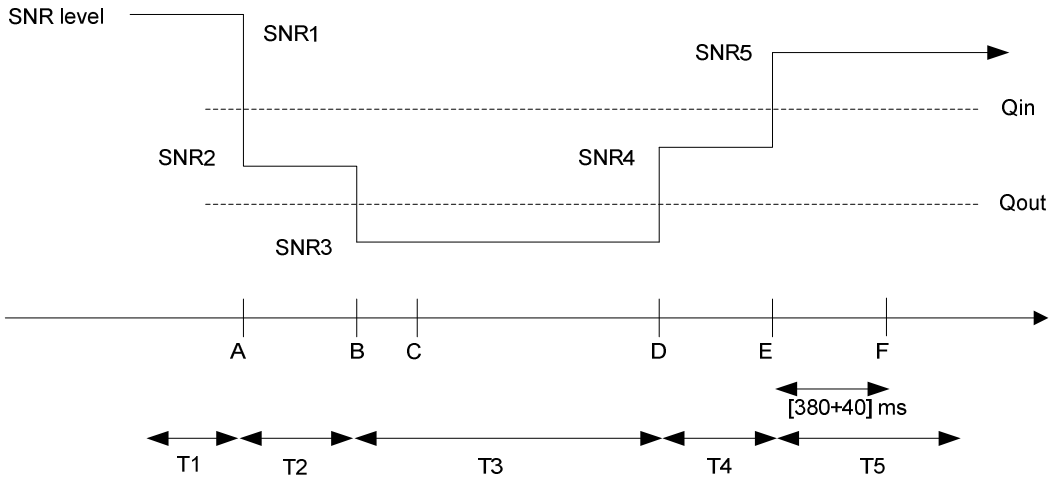

Figure 7.3.4.4-1: SNR variation for in-sync testing

7.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtest are set up according to Table 7.3.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.4.4.3.

6. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.4.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	As specified in section A.2.2 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
n sync transmission parameters (Note 1)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	
DRX			OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	ETU 70 Hz	
T1		s	0.5	0.5	
T2		s	0.4	0.4	
T3		s	1.46	1.46	
T4		s	0.4	0.4	
T5		s	1	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.4.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.4.5-1 for subtest 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.4.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.4.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.4.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.4.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each uplink subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.4.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.4.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation

CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.4.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync test 1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.4.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.4.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.4.5 Test requirement

Table 7.3.4.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.6	-4.5	-12.1	-7.2	-0.6	-1.4	-5.0	-12.8	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.4.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.4_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports

7.3.4_1.1 Test purpose

Same as 7.3.4.1.

7.3.4_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that supports 4Rx on all its TDD operating bands.

7.3.4_1.3 Minimum conformance requirements

Same as 7.3.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.4.

7.3.4_1.4 Test description

Same as 7.3.4.4.

7.3.4_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.76.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.4_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.4_1.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.4_1.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

See Table 7.3.4.4.1 with the following changes:

- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.4_1.4.2 Test procedure

Same Test Procedure as in 7.3.4.4.2 with the following changes:

- Instead of Table 7.3.4.5-1 use Table 7.3.4_1.5-1

7.3.4_1.4.3 Message contents

Same as 7.3.4.4.3.

7.3.4_1.5 Test requirement

Table 7.3.4_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x4 Low					2x4 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.1 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.6	-4.5	-15.6	-10.7	-0.6	-1.4	-5.0	-16.3	-11.7	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.4.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.5.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.5.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{out\_DRX}}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_Q_{out\_DRX}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.5.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.5.

7.3.5.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.5.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

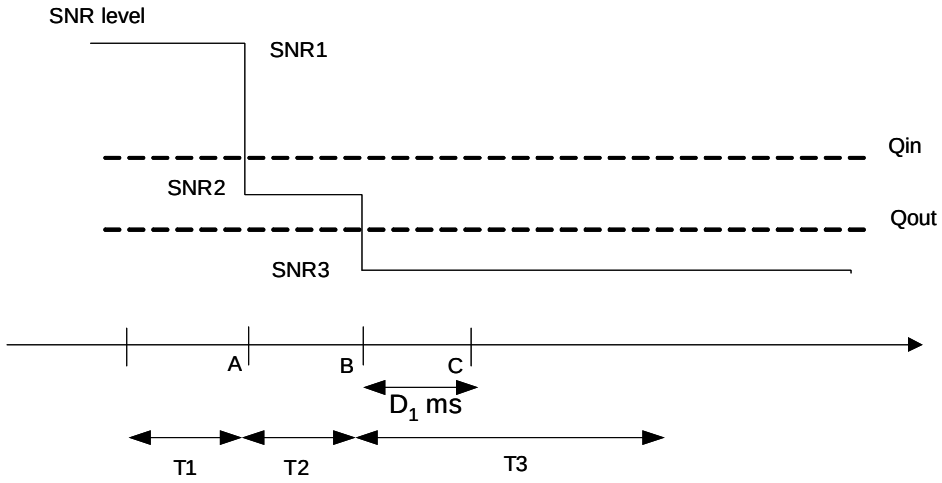

Figure 7.3.5.4-1: SNR variation for out-of-sync testing in DRX

7.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)

2. The general test parameter settings for the different subtests are set up according to Table 7.3.5.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.5.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.5.4.1-1: General test parameters for E-UTRAN FDD out-of-sync in DRX testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.7 FDD	R.6 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	1x2	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		-3	0	
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table 7.3.5.5-2
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	2	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	AWGN	.
T1		s	4	32	
T2		s	1.6	12.8	
T3		s	1.8	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.5.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.5.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B

   and

   b) For subtest 1: does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   For subtest 2: does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.5.5-1 for subtests 1 and 2.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.5.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.5.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.5.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.5.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.5.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.5.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.5.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.5.5 Test requirement

Table 7.3.5.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR[Note 6]	dB	-1.4	-5.3	-13.1	-4.1	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.5.4-1.

Table 7.3.5.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 7.3.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.5_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports

7.3.5_1.1 Test purpose

Same as 7.3.5.1.

7.3.5_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands. Applicability requires support for FGI bit 5.

7.3.5_1.3 Minimum conformance requirements

Same as 7.3.5.3.

7.3.5_1.4 Test description

Same as 7.3.5.4.

7.3.5_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.

For subtest 1:As Shown in TS 36.508 [7] Annex A figure A.75.
For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).

2. The general test parameter settings for the different subtests are set up according to Table 7.3.5_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.5_1.4.3.1
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.5_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.5.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4, instead of 2x2 low use 2x4 low

7.3.5_1.4.2 Test procedure

Same Test Procedure as in 7.3.5.4.2 with the following changes:

- Instead of Table 7.3.5.5-1 use Table 7.3.5_1.5-1
- Instead of Table 7.3.5.5-2 use Table 7.3.5_1.5-2

7.3.5_1.4.3 Message contents

Same as 7.3.5.4.3.

7.3.5_1.5 Test requirement

Table 7.3.5_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x4 Low			1x4		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR[Note 6, Note 7]	dB	-1.4	-5.3	-16.6	-4.1	-8.9	-17.6
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.5.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.5_1.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 7.3.5_1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

7.3.6.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.6.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{out\_DRX}}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_Q_{out\_DRX}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.6.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.6.

7.3.6.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.6.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

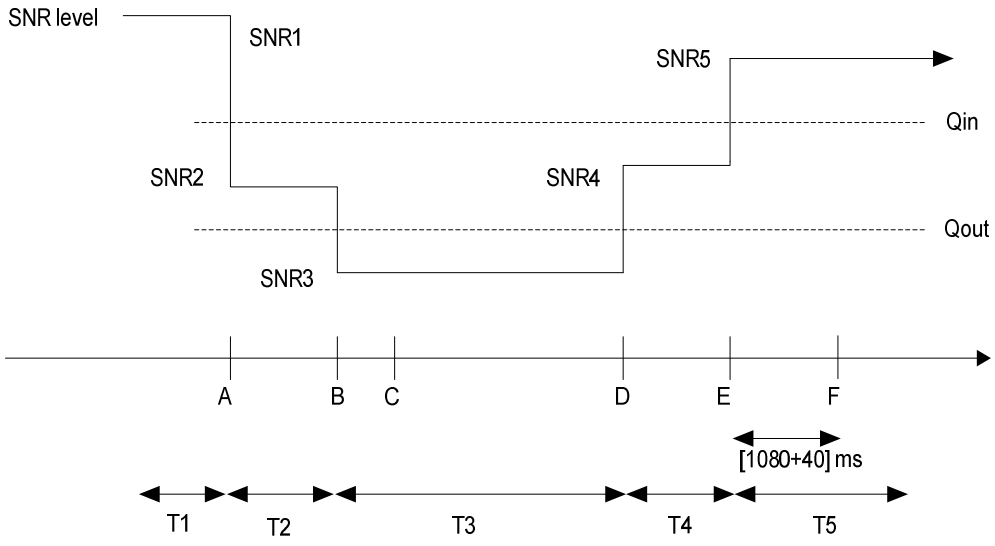

Figure 7.3.6.4-1: SNR variation for in-sync testing in DRX

7.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. The general test parameter settings for the test is set up according to Table 7.3.6.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.6.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.6.4.1-1: General test parameters for E-UTRAN FDD in-sync in DRX testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.6 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table 7.3.6.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.6.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.6.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.6.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.6.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.6.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.6.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.6.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.6.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.6.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.6.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.6.5 Test requirement

Table 7.3.6.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x2				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_R B Note1	dB					
SNR Note 6	dB	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.6.4-1.

Table 7.3.6.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [8] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.6_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports

7.3.6_1.1 Test purpose

Same as 7.3.6.1.

7.3.6_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands. Applicability requires support for FGI bit 5.

7.3.6_1.3 Minimum conformance requirements

Same as 7.3.6.3.

7.3.6_1.4 Test description

Same as 7.3.6.4.

7.3.6_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
2. The general test parameter settings for the test is set up according to Table 7.3.6_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.6_1.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.6_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.6.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4.

7.3.6_1.4.2 Test procedure

Same Test Procedure as in 7.3.6.4.2 with the following changes:

- Instead of Table 7.3.6.5-1 use Table 7.3.6_1.5-1

7.3.6_1.4.3 Message contents

Same as 7.3.6.4.3.

7.3.6_1.5 Test requirement

Table 7.3.6_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x4				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_R B Note1	dB					
SNR Note 6, Note 7	dB	-4.1	-8.9	-17.6	-12.8	-4.1
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.6.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.6_1.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.6_1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [8] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.7.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.7.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{out\_DRX}}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_Q_{out\_DRX}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.7.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.7.

7.3.7.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.7.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

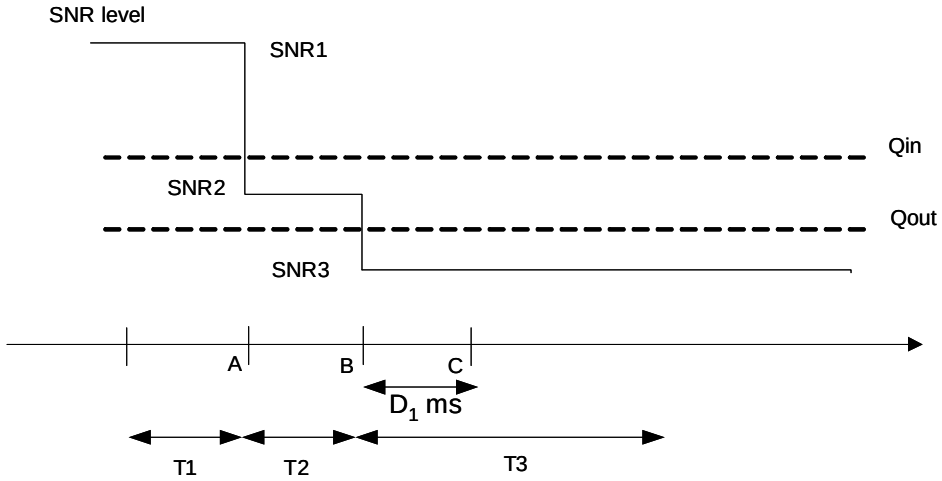

Figure 7.3.7.4-1: SNR variation for out-of-sync testing in DRX

7.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)
2. The general test parameter settings for the different subtests are set up according to Table 7.3.7.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.7.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.7.4.1-1: General test parameters for E-UTRAN TDD out-of-sync in DRX testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.7 TDD	R.6 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	1x2	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		-3	0	
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table 7.3.7.5-2
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	AWGN	.
T1		s	4	32	
T2		s	1.6	12.8	
T3		s	1.8	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.7.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.7.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B

   and

   b) For subtest 1: does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   For subtest 2: does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.7.5-1 for subtests 1 and 2.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.7.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.7.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.7.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.7.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_DRX_L
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.7.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.7.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.7.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.7.5 Test requirement

Table 7.3.7.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 8	dB	-1.4	-5.0	-12.8	-4.5	-8.5	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.7.4-1.

Table 7.3.7.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	Disable	

Table 7.3.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.7_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports

7.3.7_1.1 Test purpose

Same as 7.3.7.1.

7.3.7_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its TDD operating bands. Applicability requires support for FGI bit 5.

7.3.7_1.3 Minimum conformance requirements

Same as 7.3.7.3.

7.3.7_1.4 Test description

Same as 7.3.7.4.

7.3.7_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source or faders to the UE antenna connectors as stated below:

For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.76
For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders)

2. The general test parameter settings for the test is set up according to Table 7.3.7_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.7_1.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.7_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.7.4.1-1 with the following changes:

- Instead of antenna configuration 2x2 low use 2x4 low.
- Instead of antenna configuration 1x2 use 1x4.

7.3.7_1.4.2 Test procedure

Same Test Procedure as in 7.3.7.4.2 with the following changes:

- Instead of Table 7.3.7.5-1 use Table 7.3.7_1.5-1

7.3.7_1.4.3 Message contents

Same as 7.3.7.4.3.

7.3.7_1.5 Test requirement

Table 7.3.7_1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x4 Low			1x4		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 8, Note 9	dB	-1.4	-5.0	-16.3	-4.5	-8.5	-17.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.7.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.7_1.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	Disable	

Table 7.3.7_1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

7.3.8.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.8.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{out\_DRX}}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_Q_{out\_DRX}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.8.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.8.

7.3.8.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.8.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

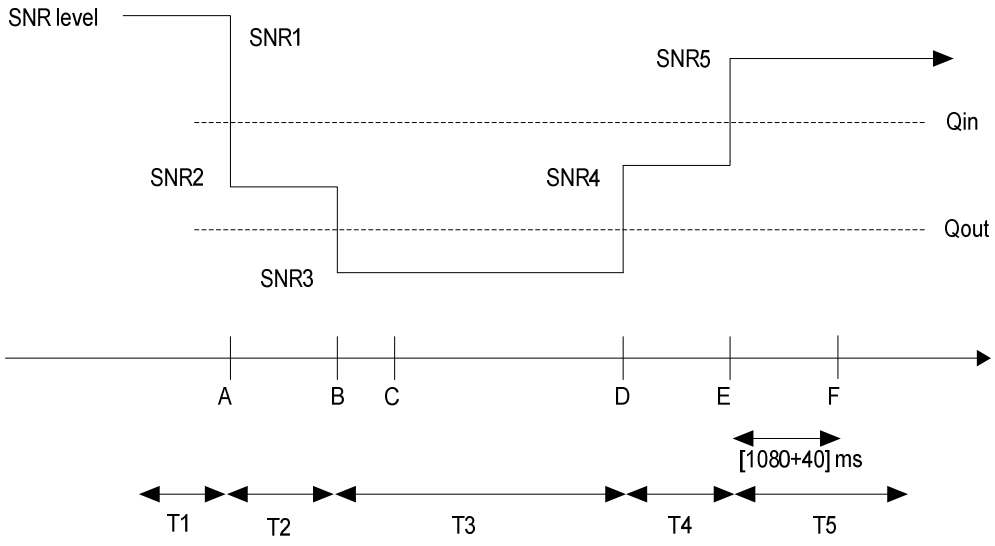

Figure 7.3.8.4-1: SNR variation for in-sync testing in DRX

7.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1 Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. The general test parameter settings for the test is set up according to Table 7.3.8.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.8.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.8.4.1-1: General test parameters for E-UTRAN TDD in-sync in DRX testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.6 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Antenna Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table 7.3.8.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.8.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.8.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.8.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.8.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.8.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.8.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.8.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.8.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.8.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.8.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.8.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.8.5 Test requirement

Table 7.3.8.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x2				
Special subframe configuration[Note1]		6				
Uplink-downlink configuration[Note2]		1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note1]	dB					
OCNG_R B[Note1]	dB					
SNR [Note 8]	dB	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.8.4-1.

Table 7.3.8.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.8_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports

7.3.8_1.1 Test purpose

Same as 7.3.8.1.

7.3.8_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its TDD operating bands. Applicability requires support for FGI bit 5.

7.3.8_1.3 Minimum conformance requirements

Same as 7.3.8.3.

7.3.8_1.4 Test description

Same as 7.3.8.4.

7.3.8_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
2. The general test parameter settings for the test is set up according to Table 7.3.7_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.7_1.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.8_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.8.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4.

7.3.8_1.4.2 Test procedure

Same Test Procedure as in 7.3.8.4.2 with the following changes:

- Instead of Table 7.3.8.5-1 use Table 7.3.8_1.5-1.

7.3.8_1.4.3 Message contents

Same as 7.3.8.4.3.

7.3.8_1.5 Test requirement

Table 7.3.8_1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x4				
Special subframe configuration Note1		6				
Uplink-downlink configuration Note2		1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_R B Note1	dB					
SNR Note 8, Note 9	dB	-4.5	-8.5	-17.2	-13.2	-4.5
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.8.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.8_1.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.8_1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.9.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.9.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.9.

7.3.9.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.9.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

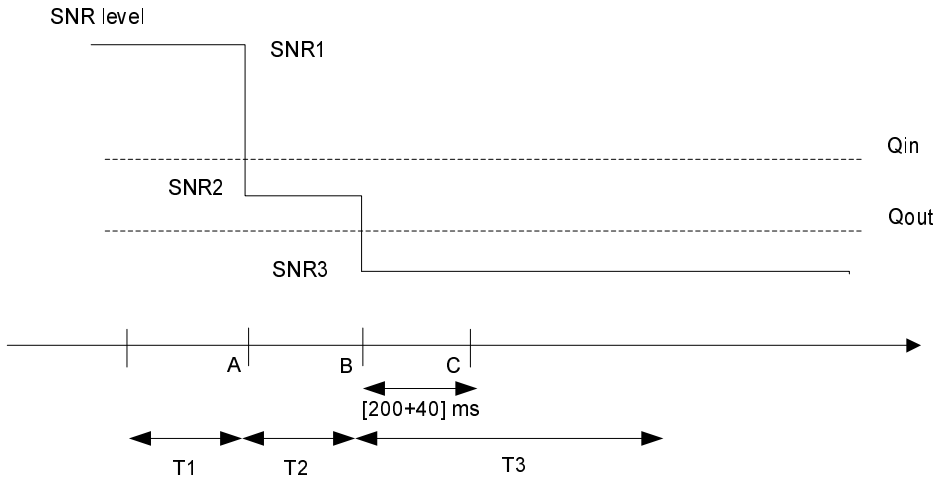

Figure 7.3.9.4-1 SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.9.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.9.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.9.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		µs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			$(PCI_{cell1}-PCI_{cell2})$mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern			'10000000100000001000000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell -r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.9.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.9.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.9.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.9.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.9.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.9.4.3-1: Common Exception messages for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.9.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.9.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.9.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.9.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'10000000100000001000000010000000010000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.9.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.9.5 Test requirements

Table 7.3.9.5-1: Cell specific test requirement parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.1.6 (FDD)		OP.6 FDD			OP.6 FDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30			ETU 30		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.9.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.10.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.10.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.10.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.10.

7.3.10.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.10.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

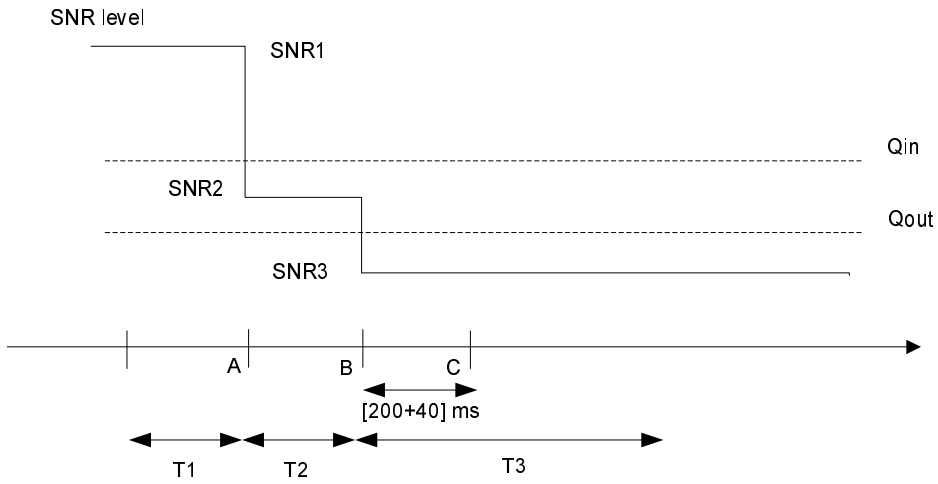

Figure 7.3.10.4-1 SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.10.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.10.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.10.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2})mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency.
ABS pattern			10000000001000000000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in section 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			10000000001000000000	MeasSubframePattern IE is configured in UE for serving cell measurement as defined in section 6.3.6 in TS 36.331.
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		µs	3	
Propagation channel			ETU30	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.10.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.10.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.10.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.10.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.10.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.10.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.10.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.10.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.10.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.10.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.10.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.10.5 Test requirements

Table 7.3.10.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 3]	dB						
OCNG_RB[Note 3]	dB						
SNR [Note 8]	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU30			ETU30		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 of active cell is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.10.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.11.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.11.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.11.

7.3.11.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.11.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

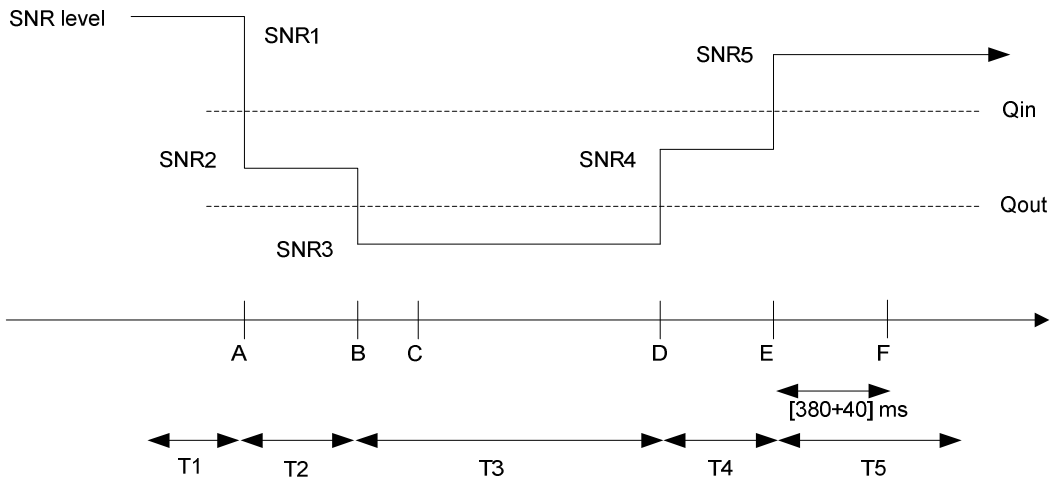

Figure 7.3.11.4-1 SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.11.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.11.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.11.4.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on E-UTRA RF channel number 1; Cell 2 generates interference over restricted resources.
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-2
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters for the active cell (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters for active cell (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		μs	3	
Propagation channel			ETU30	
T1		s	0.5	
T2		s	0.4	

T3	s	1.46	
T4	s	0.4	
T5	s	1	
Physical cell ID PCI		(PCI_{cell1}-PCI_{cell2})mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern		'10000000100000001000000100000010000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern		'10000000100000001000000100000010000'	Time domain measurement pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell - r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.11.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.11.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.11.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.11.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.11.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.11.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.11.4.3-1: Common Exception messages for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.11.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

TTable 7.3.11.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.11.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.11.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
}			
}			

7.3.11.5 Test requirements

Table 7.3.11.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction (eICIC)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
PCFICH/PDCCH/PHICH parameters		R.9 FDD					R.9 FDD				
Number of Control OFDM symbols		3					3				
OCNG Pattern defined D.1.6 (FDD)		OP.6 FDD					OP.6 FDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.11.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.12.1 Test purpose

To verify that the UE properly detects in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.12.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.11.

7.3.12.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.12.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

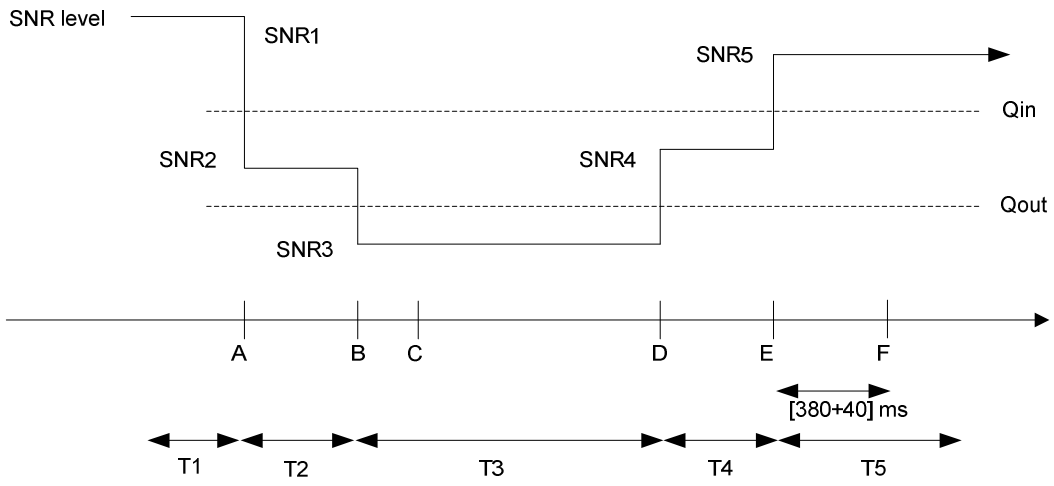

Figure 7.3.12.4-1 SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.12.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.12.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.12.4.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on E-UTRA RF channel number 1; Cell 2 generates interference over restricted resources.
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-2
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters for the active cell (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters for active cell (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	3	
Propagation channel			ETU30	
T1		s	0.5	
T2		s	0.4	

T3	s	1.46	
T4	s	0.4	
T5	s	1	
Physical cell ID PCI		(PCI_{cell1}-PCI_{cell2})mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern		'1000000000 1000000000'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern		'1000000000 1000000000'	Time domain measurement pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell - r10 as defined in TS 36.331, clause 6.3.2. Configured in Cell 1.
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.12.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.12.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.12.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.12.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.12.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.12.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.12.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.12.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.12.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.12.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.12.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

7.3.12.5 Test requirements

Table 7.3.12.5-1: Cell specific test requirement parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction (eICIC)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
Special subframe configuration Note1		6					6				
Uplink-downlink configuration Note2		1					1				
PCFICH/PDCCH/PHICH parameters		R.9 TDD					R.9 TDD				
Number of Control OFDM symbols		3					3				
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 3	dB										
OCNG_RB Note 3	dB										
SNR Note 8	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8]	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.12.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.13.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.13.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.13.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.13.

7.3.13.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.13.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

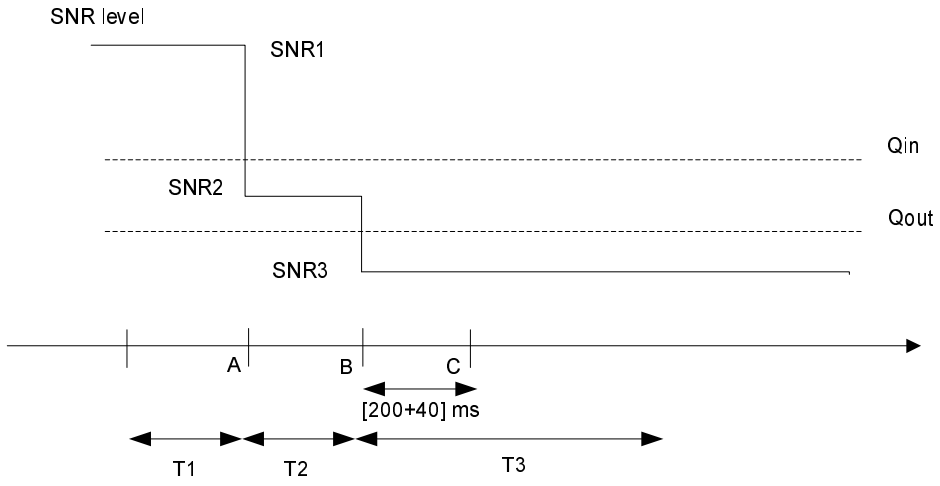

Figure 7.3.13.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.13.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.13.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.13.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD for the serving cell (Cell 1) OP.9 FDD for the neighbour cell (Cell 2)	As specified in section D.1.6 and D.1.9 respectively
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		µs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency
ABS pattern			'01000000100000001000000000010000001000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'01000000100000001000000000010000001000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePattern-Serv-r10 as defined in TS 36.331, clause 6.3.2.
Note: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.13.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.13.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.13.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.13.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.13.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.13.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.13.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.13.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.13.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.13.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.13.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
}			

Table 7.3.13.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

Table 7.3.13.4.3-8: *SystemInformationBlockType1 :* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.13.5 Test requirements

Table 7.3.13.5-1: Cell specific test requirement parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.1.6 (FDD) and D.1.9 (FDD)		OP.6 FDD			OP.9 FDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.13.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.14.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.14.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.14.

7.3.14.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.14.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

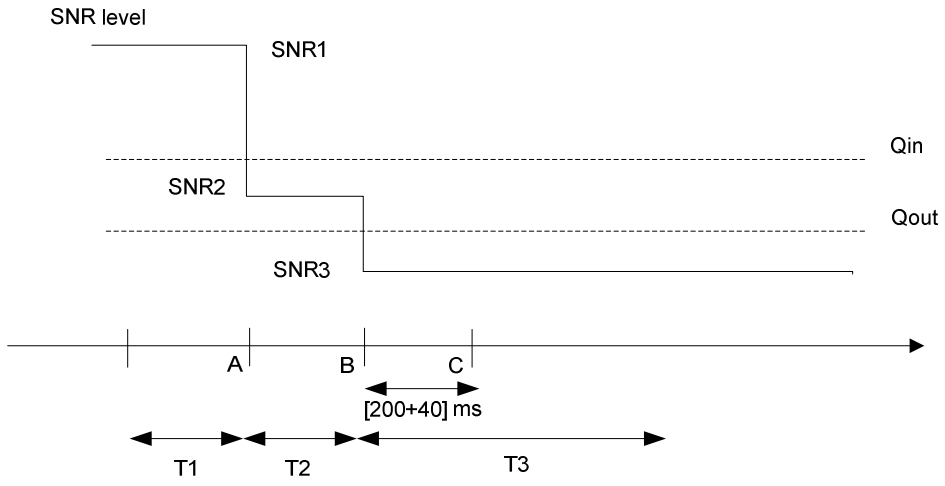

Figure 7.3.14.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.14.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.14.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.14.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.TDD	As specified in clause A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD for the serving cell (Cell 1) OP.6 TDD for the neighbour cell (Cell 2)	As specified in clause D.2.2 and D.2.6 respectively
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		µs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency
ABS pattern			'00001000000000100000'	MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement resource restriction pattern			'00001000000000100000'	Time-domain measurement resource restriction pattern for serving cell measurements signalled to the UE in message measSubframePattern-Serv-r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.14.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.14.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.14.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.14.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.14.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.14.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.14.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.14.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.14.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.14.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.14.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	Cell 2
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 7.3.14.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

Table 7.3.14.4.3-8: *SystemInformationBlockType1 :* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.14.5 Test requirements

Table 7.3.14.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.2.2 (TDD) and D.2.6 (TDD)		OP.2 TDD			OP.6 TDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 7,8]	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure 7.3.14.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.15.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.15.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.15.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.15.

7.3.15.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.15.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

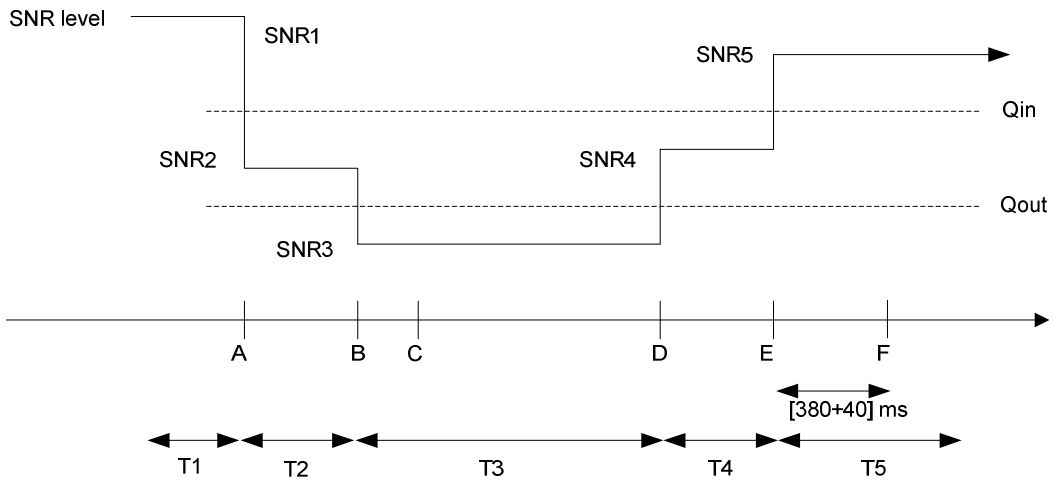

Figure 7.3.15.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.15.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.15.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.15.4.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test.
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
OCNG parameters for Cell 1			OP.6 FDD	As specified in section D.1.6.
OCNG parameters for Cell 2			OP.9 FDD	As specified in section D.1.9.
CP length			Normal	
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-2
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			$(PCI_{cell1}-PCI_{cell2}) \bmod 3 = 0$, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			01000000100000001000000000010000000001000000	FDD ABS Pattern Info IE is configured in Cell 2 as defined in section 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement			01000000100000001000	MeasSubframePattern IE is

resource restriction pattern		0000010000001000000	configured in UE for serving cell measurement as defined in section 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	Minimum CQI reporting periodicity
Time offset between cells	µs	3	
Propagation channel		ETU30	
T1	s	0.5	
T2	s	0.4	
T3	s	1.46	
T4	s	0.4	
T5	s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.15.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.15.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.15.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.15.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.15.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.15.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.15.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.15.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.15.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.15.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.15.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.15.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
}			

Table 7.3.15.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

7.3.15.5 Test requirements

Table 7.3.15.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
OCNG Pattern defined in D.1.6 (FDD) and D.1.9 (FDD)		OP.6 FDD					OP.9 FDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.15.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.16.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.16.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.16.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.16.

7.3.16.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.16.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

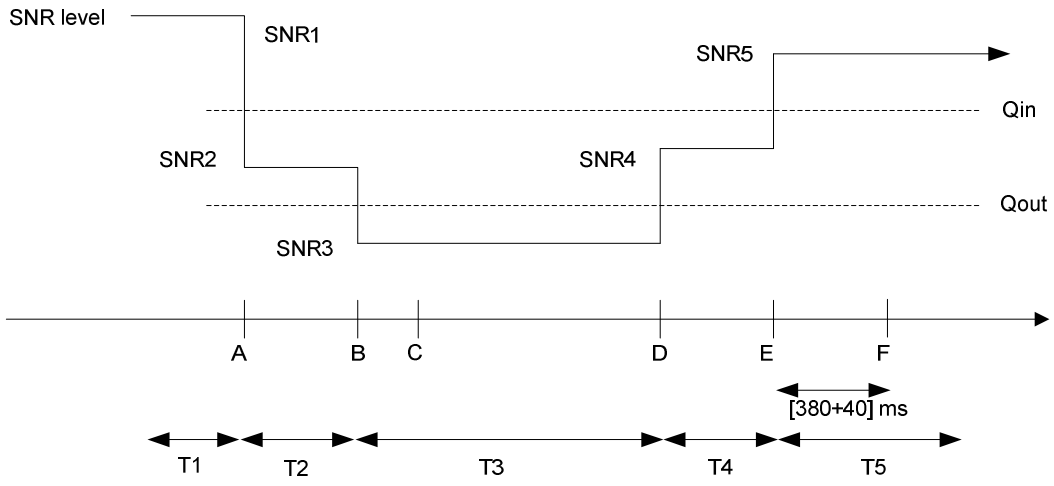

Figure 7.3.16.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.16.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.16.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.16.4.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in clause A.2.2. None of the PDCCH are intended for the UE under test
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-2
OCNG parameters for Cell 1			OP.2 TDD	As specified in clause D.2.2.
OCNG parameters for Cell 2			OP.6 TDD	As specified in clause D.2.6.
CP length			Normal	
Neighbour cell ABS configuration			MBSFN ABS	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			00001000000000100000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in clause 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement			00001000000000100000	MeasSubframePattern IE is

resource restriction pattern			configured in UE for serving cell measurement as defined in clause 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	1	Minimum CQI reporting periodicity
Time offset between cells	µs	3	
Propagation channel		ETU30	
T1	s	0.5	
T2	s	0.4	
T3	s	1.46	
T4	s	0.4	
T5	s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.16.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.16.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.16.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.16.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.16.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.16.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.16.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.16.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.16.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.16.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.16.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.16.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	Cell 2
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 7.3.16.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

7.3.16.5 Test requirements

Table 7.3.16.5-1: Cell specific test parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2.2 (TDD) and D.2.6 (TDD)		OP.2 TDD					OP.6 TDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 1]	dB										
OCNG_RB[Note 1]	dB										
SNR [Note 8]	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.16.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.17.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.17.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.17.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.17.

7.3.17.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.17.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

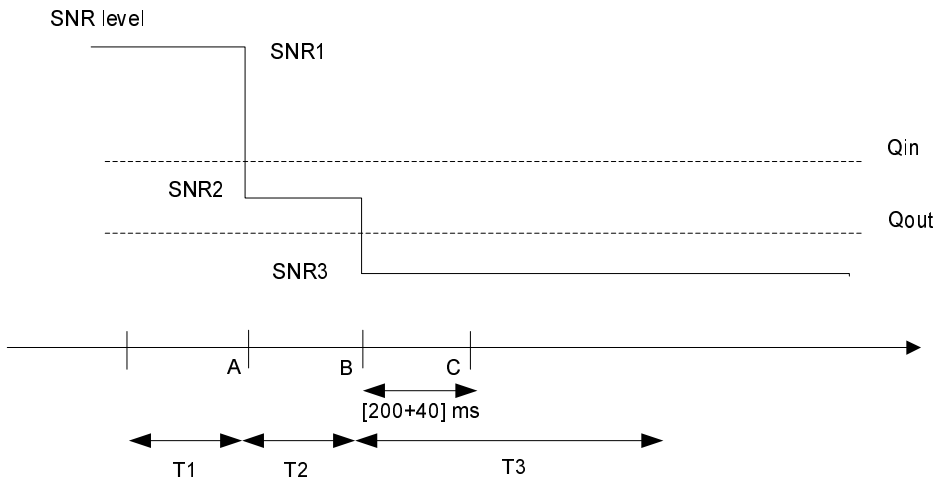

Figure 7.3.17.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

7.3.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.17.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.17.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.17.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.7 FDD	As specified in clause A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
PCell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells			Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		μs	Cell 2 time offset with respect to Cell 1: 3 Cell 3 time offset with respect to Cell 1: 2	Three synchronous cells
Frequency shift between cells		Hz	Cell 2 frequency shift with respect to Cell 1: 300 Cell 3 frequency shift with respect to Cell 1: -100	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell IDs			$(PCI_{cell1}-PCI_{cell2})mod3 = 0$ $(PCI_{cell1}-PCI_{cell3})mod3!= 0$ PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that all conditions are met
ABS pattern			'10000000100000001000000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.

Time domain measurement resource restriction pattern			'10000000100000001000 00001000000010000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 and Cell 3 in *CRS-AssistanceInfo*. It includes a single *MBSFN-SubframeConfig* element with subframe allocation *oneFrame*='000000'
	antennaPortsCount		an2	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.17.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2 and Cell 3 according to T1 in Table 7.3.17.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.17.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.17.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.17.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.17.4.3-1: Common Exception messages for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.17.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.17.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.17.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.17.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for for	

		Cell3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.17.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2, Cell 3
}			

7.3.17.5 Test requirements

Table 7.3.17.5-1: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1			1		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low			2x2 Low		
OCNG Pattern defined in D.1.6 (FDD)		OP.6 FDD			OP.6 FDD			OP.6 FDD		
ρ_A, ρ_B		-3			-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1		
PDCCH_RA	dB	1								
PDCCH_RB	dB	1								
PBCH_RA	dB	-3								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note1]	dB									
OCNG_RB[Note1]	dB									
SNR [Note 6]	dB	-0.6	-4.3	-14.6	3.8	3.8	4.2	1.8	1.8	2.2
N_{oc}	dBm/15 kHz	-98			-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz			ETU 30 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.17.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.18.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.18.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.18.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.18.

7.3.18.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms. The non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.18.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

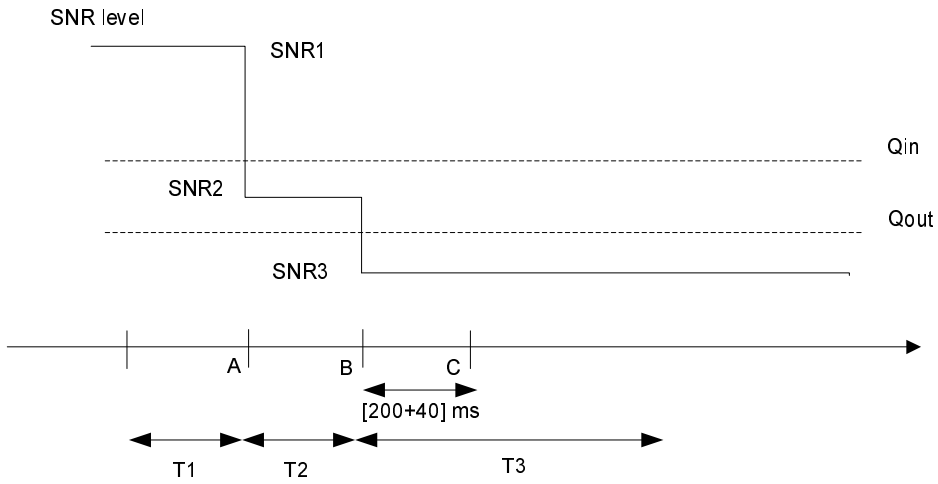

Figure 7.3.18.4-1:SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

7.3.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.18.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.18.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.18.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.7.TDD	As specified in clause A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in clause D.2.2
PCell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells			Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	Cell 2 time offset with respect to Cell 1: 3 Cell 3 time offset with respect to Cell 1: 2	Three synchronous cells
Frequency shift between cells		Hz	Cell 2 frequency shift with respect to Cell 1: 300 Cell 3 frequency shift with respect to Cell 1: -100	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell IDs			$(PCI_{cell1}-PCI_{cell2})mod3 = 0$ $(PCI_{cell1}-PCI_{cell3})mod3!= 0$ PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that all conditions are met
ABS pattern			'00001000000000100000'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.

Time domain measurement resource restriction pattern			'0000100000000000100000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in *CRS-AssistanceInfo*. It includes a single *MBSFN-SubframeConfig* element with subframe allocation *oneFrame*='000000'
	antennaPortsCount		an2	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.18.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.
2. Set the parameters for Cell 1, Cell 2 and Cell 3 according to T1 in Table 7.3.18.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.18.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.18.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.18.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.18.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1
Default RRC messages and information elements contents exceptions	

Table 7.3.18.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.18.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.18.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.18.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is	

		provided for for Cell3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.18.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2, Cell 3
}			

7.3.18.5 Test requirements

Table 7.3.18.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS (feICIC)

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1			1		
$BW_{channel}$	MHz	10			10			10		
Special subframe configuration[Note1]		6			6			6		
Uplink-downlink configuration[Note2]		1			1			1		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low			2x2 Low		
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD			OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.		
PDCCH_RA	dB	1								
PDCCH_RB	dB	1								
PBCH_RA	dB	-3								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note1]	dB									
OCNG_RB[Note1]	dB									
SNR [Note 6]	dB	-0.6	-4.3	-14.6	3.8	3.8	4.2	1.8	1.8	2.2
N_{oc}	dBm/15 kHz	-98			-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz			ETU 30 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure 7.3.18.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.19.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.19.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.19.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.19.

7.3.19.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.19.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

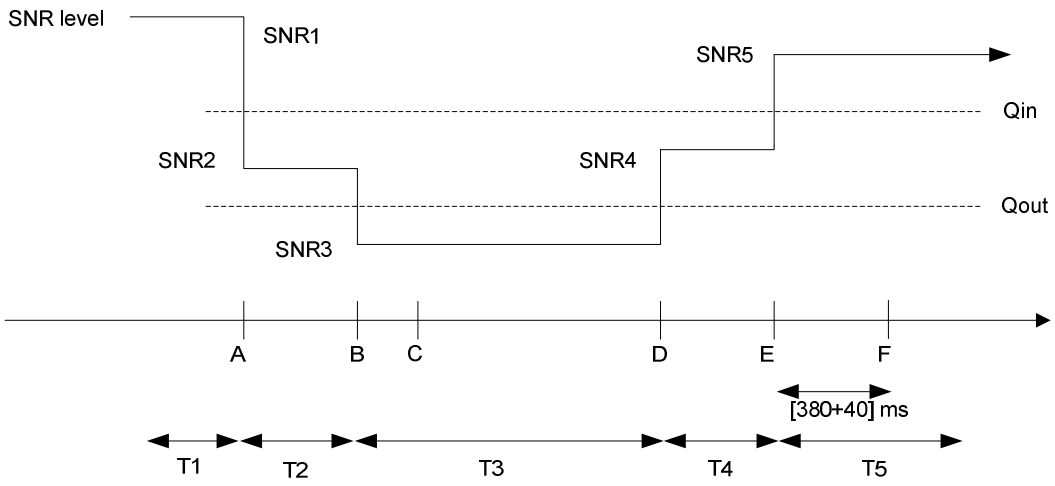

Figure 7.3.19.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.19.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.19.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.19.4.1-1: General test parameters for E-UTRAN FDD in-sync radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 FDD	R.9 FDD	R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	OP.6 FDD	OP.6 FDD	As specified in section D.1.6
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	Non-MBSFN ABS		As defined in Table C.3.1.1.2-2.
ABS Pattern			N/A	1000000010 0000001000 0000100000 0010000000	1000000010 0000001000 0000100000 0010000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.
Time domain measurement resource restriction pattern			'1000000010000000100000000100000000'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistant information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'
	antennaPortsCount			an2	an2	
	mbsfn-SubframeConfigList			oneFrame = '000000'	oneFrame = '000000'	
Time offset between cells (With respect to Cell 1)		us	0	3	2	
Frequency shift between cells (With respect to Cell 1)		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	(PCI_{cell1}-PCI_{cell2}) mod3 = 0	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that all conditions are met

				PCI_{cell1} not equal to PCI_{cell2}		
In sync transmission parameters (Note 1)		DCI format	1C	1C	1C	
In sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.4 in TS 36.212
	Aggregation level	CCE	4	4	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE		1			
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	
	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.3 in TS 36.212
	Aggregation level	CCE	8	8	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE	dB	1			
DRX			OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	N/A		T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2			Minimum CQI reporting periodicity
T1		s	0.5	N/A		
T2		s	0.4			
T3		s	1.46			
T4		s	0.4			
T5		s	1			
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.						

7.3.19.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.19.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.19.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.19.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.19.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.19.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.19.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.19.4.3-1: Common Exception messages for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.19.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.19.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.19.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.19.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5 Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

7.3.19.5 Test requirements

Table 7.3.19.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
PCFICH/PDCCH/ PHICH parameters		R.9 FDD					R.9 FDD					R.9 FDD				
OCNG Pattern defined in D.1.6 (FDD)		OP.6 FDD					OP.6 FDD					OP.6 FDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 1	dB															
OCNG_RB Note 1	dB															
SNR Note 6	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/ 15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.19.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.20.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the Pcell under time domain measurement resource restriction with CRS assistance information.

7.3.20.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.20.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.20.

7.3.20.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.20.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

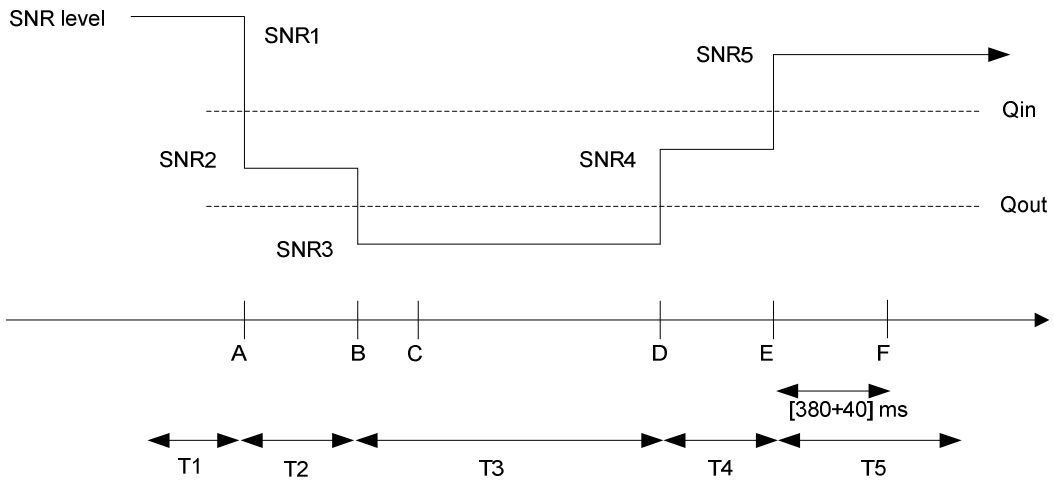

Figure 7.3.20.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.20.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.20.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.20.4.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 TDD	R.9 TDD	R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	Non-MBSFN ABS		As defined in Table C.3.1.1.2-2
ABS Pattern			N/A	'00001000000000100000'	'00001000000000100000'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2 and Cell 3. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'00001000000000100000'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistant information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'
	antennaPortsCount			an2	an2	
	mbsfn-SubframeConfigList			oneFrame = '000000'	oneFrame = '000000'	
Time offset from Cell 1		us	0	3	2	
Frequency offset		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to	(PCI_{cell1}-PCI_{cell3}) mod3 != 0	Cell PCIs are selected so that all conditions are met

				PCI_{cell2}		
In sync transmission parameters (Note 1)	DCI format		1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	3	3	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	4	
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE		1			
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	3	3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE	dB	1			
DRX			OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	N/A		T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1			Minimum CQI reporting periodicity
T1		s	0.5	N/A		
T2		s	0.4			
T3		s	1.46			
T4		s	0.4			
T5		s	1			
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.						

7.3.20.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.20.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.20.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.20.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.20.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.20.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.20.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.20.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.20.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.20.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.20.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.20.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

7.3.20.5 Test requirements

Table 7.3.20.5-1: Cell specific test requirement parameters for E-UTRAN TDD for in-sync radio link monitoring (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
Special subframe configuration Note 1		6					6					6				
Uplink-downlink configuration Note 2		1					1					1				
PCFICH/PDCCH/ PHICH parameters		R.9 TDD					R.9 TDD					R.9 TDD				
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD					OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 3	dB															
OCNG_RB Note 3	dB															
SNR Note 8	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/ 15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.20.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)

7.3.21.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction with CRS assistance information.

7.3.21.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.21.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.21.

7.3.21.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.21.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

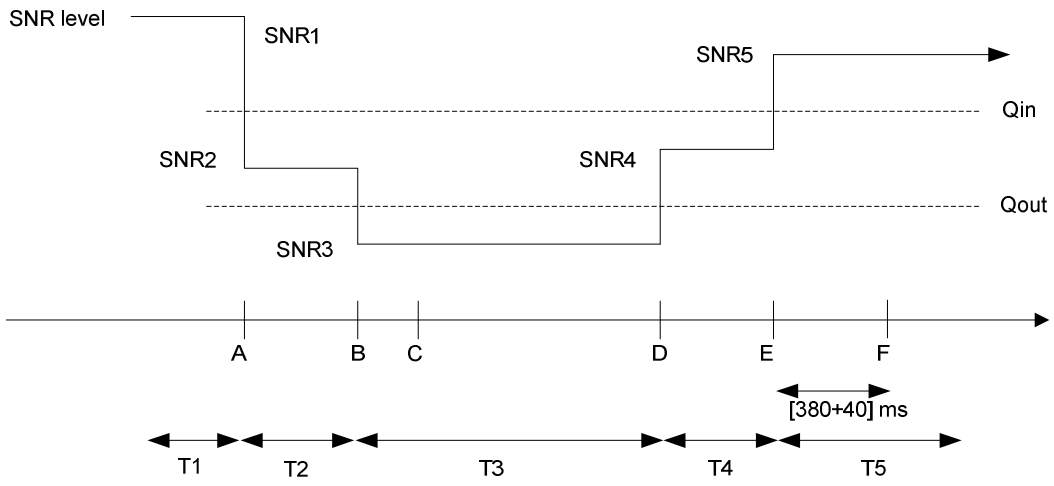

Figure 7.3.21.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.21.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.21.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.21.4.1-1: General test parameters for E-UTRAN FDD in-sync testing radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 FDD	R.9 FDD	R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	OP.9 FDD	OP.9 FDD	As specified in section D.1.6 and D.1.9.
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	MBSFN ABS		As defined in Table C.3.1.2.2-2.
ABS Pattern			N/A	0100000010 0000001000 0000001000 0001000000	0100000010 0000001000 0000001000 0001000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. MBSFN subframes are configured in the ABS subframes configured in Cell 2 and Cell 3 prior to the start of T1.
Time domain measurement resource restriction pattern			'0100000010000000100000000100000100000'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrames = '10000100010000010000 1000'
	antennaPortsCount			an2	an2	
	mbsfn-SubframeConfigList			fourFrames = '10000100010000010000'	fourFrames = '10000100010000010000'	
Time offset between cells (With respect to Cell 1)		us	0	3	2	
Frequency shift between cells (With respect to Cell 1)		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	(PCI_{cell1}-PCI_{cell2})	(PCI_{cell1}-PCI_{cell3})	Cell PCIs are selected so that all conditions are met

				mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	mod3 != 0	
In sync transmission parameters (Note 1)		DCI format	1C	1C	1C	
In sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.4 in TS 36.212
	Aggregation level	CCE	4	4	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
	Ratio of PCFICH to RS EPRE		1			
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	
	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.3 in TS 36.212
	Aggregation level	CCE	8	8	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
	Ratio of PCFICH to RS EPRE	dB	1			
DRX			OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	N/A		T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2			Minimum CQI reporting periodicity
T1		s	0.5	N/A		
T2		s	0.4			
T3		s	1.46			
T4		s	0.4			
T5		s	1			
NOTE 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.						

7.3.21.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.21.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.21.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.21.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.21.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.21.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.21.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.21.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.21.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.21.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (felCIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.21.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.21.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'10000100010000010000 01000'	The CRS assistance information is provided for Cell 2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams=' 10000100010000 0100001000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'10000100010000010000	The CRS	

	1000'	assistance information is provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams=' 10000100010000 0100001000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.21.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 2, Cell 3
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'10000100010000010000 1000'B		
}			
}			

Table 7.3.21.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3

7.3.21.5 Test requirements

Table 7.3.21.5-1: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
PCFICH/PDCCH/ PHICH parameters		R.9 FDD					R.9 FDD					R.9 FDD				
OCNG Pattern defined in D.1.6 and D.1.9 (FDD)		OP.6 FDD					OP.9 FDD					OP.9 FDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 1	dB															
OCNG_RB Note 1	dB															
SNR Note 6	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/ 15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

NOTE 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
NOTE 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
NOTE 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
NOTE 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
NOTE 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.21.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)

7.3.22.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction with CRS assistance information.

7.3.22.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.22.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.22.

7.3.22.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.22.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1

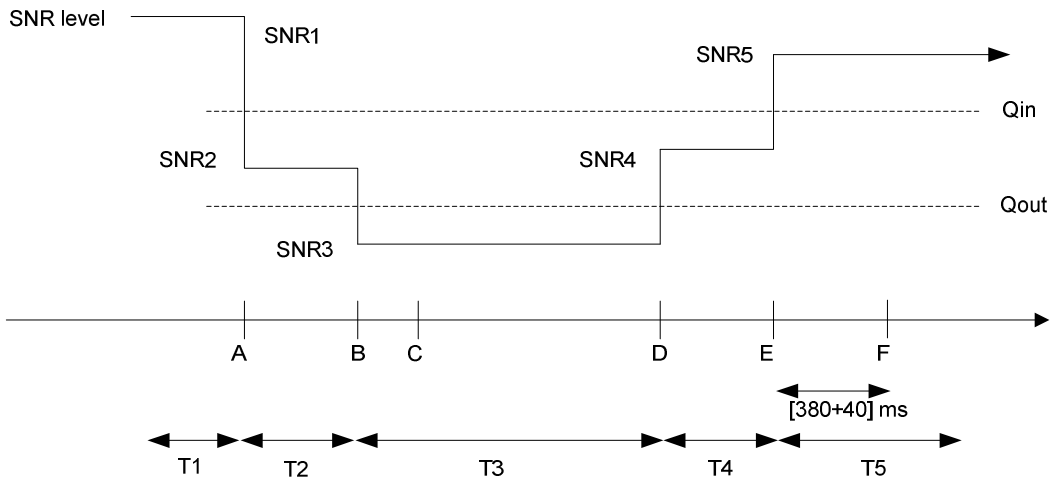

Figure 7.3.22.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.22.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.22.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.22.4.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test

rameter	Unit	Value			Com
		Test 1			
		Cell 1	Cell 2	Cell 3	
H/PHICH		R.9 TDD	R.9 TDD	R.9 TDD	As specified in s None of the PD intended for the
ters		OP.2 TDD	OP.6 TDD	OP.6 TDD	As specified in s and D.2.6.
		PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 an E-UTRA RF cha
		Normal	Normal	Normal	
annel Number		1	1	1	One E-UTRA TI frequency is use
el Bandwidth	MHz	10	10	10	
rix and Antenna		2x2 Low	2x2 Low	2x2 Low	Correlation Mat Antenna Config defined in TS 36 Annex B.2.3.2
BS configuration		N/A	MBSFN ABS		As defined in Ta
		N/A	00001000000000100000	00001000000000100000	TDD ABS Patte defined in TS 36 clause 9.2.54. C Cell 2 and Cell 3 The first/leftmos corresponds to subframe #0 of satisfying SFN r where x is the s string (20) divid MBSFN subfran configured in th subframes.
easurement tion pattern		'00001000000000100000'	N/A	N/A	Time domain m resource restric serving cell mea signalled to the measSubframel r10 as defined i clause 6.3.2.
physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assist information is pr 2 and Cell 3 in C AssistanceInfo. single MBSFN-SubframeConfig subframe alloca fourFrames = '010000100001
antennaPortsCount			an2	an2	
mbsfn-SubframeConfigList			fourFrames = '01000010000100001000000'	fourFrames = '01000010000100001000000'	
n Cell 1	us	0	3	2	
et	Hz	0	300	-100	
)		PCI_{cell1}	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	(PCI_{cell1}-PCI_{cell3}) mod3 != 0	Cell PCIs are se all conditions ar
DCI format		1C	1C	1C	As defined in se in TS 36.212
Number of Control OFDM symbols		2	2	2	In sync threshol corresponding h PDCCH/PCFICI parameters are TS 36.133 [4] se and Table 7.6.1
Aggregation level	CCE	4	4	4	
ρ_A, ρ_B		-3	-3	-3	
Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
Ratio of PCFICH to RS EPRE		1			
DCI format		1A	1A	1A	As defined in se

					in TS 36.212
Number of Control OFDM symbols		2	2	2	Out of sync thre the correspondi
Aggregation level	CCE	8	8	8	PDCCH/PCFICI
ρ_A, ρ_B		-3	-3	-3	parameters are
Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		TS 36.133 [4] s and Table 7.6.1
Ratio of PCFICH to RS EPRE	dB	1			
		OFF	OFF	OFF	
		Enabled	Disable	Disable	Counters: N310 = 1; N311
	ms	2000	N/A		T310 is enabled
	ms	1000			T311 is enabled
porting mode		PUCCH 1-0			As defined in Ta TS 36.213
eriodicity	ms	1			Minimum CQI re periodicity
	s	0.5	N/A		
	s	0.4			
	s	1.46			
	s	0.4			
	s	1			

CH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Chan

7.3.22.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.22.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.22.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.22.5-1. T3 starts.

5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.22.5-1. T4 starts.

6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.22.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.22.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.22.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.22.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.22.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.22.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'01000010000100000100000'	The CRS assistance information is provided for Cell 2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams= '01000010000100 0010000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'01000010000100001000000'	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams= '01000010000100 0010000000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.22.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfigList	Not present		Cell 1
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 2, Cell 3
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'01000010000100001000 0000'B		
}			
}			

Table 7.3.22.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3

7.3.22.5 Test requirements

Table 7.3.22.5-1: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
Special subframe configuration Note 1		6					6					6				
Uplink-downlink configuration Note 2		1					1					1				
PCFICH/PDCCH/ PHICH parameters		R.9 TDD					R.9 TDD					R.9 TDD				
OCNG Pattern defined in D.2.2 and D.2.6 (TDD)		OP.2 TDD					OP.6 TDD					OP.6 TDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 3	dB															
OCNG_RB Note 3	dB															
SNR Note 8	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/ 15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.22.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth

7.3.23.1 Test purpose

Same test purpose as defined in clause 7.3.1.1.

7.3.23.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N.

7.3.23.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.1.3 with the following exceptions:

- Instead of A.7.3.1 → use A.7.3.23.

7.3.23.4 Test description

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.23.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

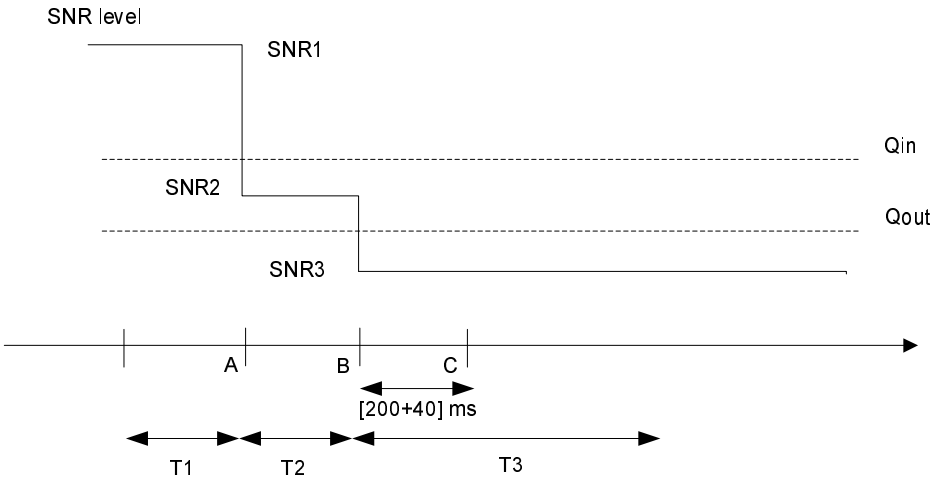

Figure 7.3.23.4-1: SNR variation for out-of-sync testing

7.3.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.23.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.23.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.23.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing for 5MHz bandwidth

Parameter		Unit	Value	Comment
			Test 4	
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.16 FDD	As specified in clause D.1.16.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
Out of sync transmission parameters (Note 1)	Number of Control OFDM Symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				
Note 2: See Table 7.3.1.4.1-1 for other general test parameters.				
Note 3: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.23.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.23.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.23.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.23.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.23.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.23.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.23.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.23.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.23.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.23.5 Test requirement

Same test requirement as defined in clause 7.3.1.5 with the following exceptions:

Tables 7.3.1.4.1-1 and 7.3.23.5-1 define the primary level settings for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring for 5MHz bandwidth.

Table 7.3.23.5-1: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring test #4 under 5MHz Bandwidth

Parameter	Unit	Test 4		
		T1	T2	T3
$BW_{channel}$	MHz	5		
OCNG Pattern defined in A.3.2.1.16 (FDD)		OP.16 FDD		
SNR Note 6	dB	-1.4	-4.8	-13.1
Note 1: See Table 7.3.1.5-2 for other cell specific test parameters.				

7.3.23_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth with 4 Rx antenna ports

7.3.23_1.1 Test purpose

Same test purpose as defined in clause 7.3.1.1.

7.3.23_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands and that only supports E-UTRA bands within band group FDD_N.

7.3.23_1.3 Minimum conformance requirements

Same as 7.3.23.3.

7.3.23_1.4 Test description

Same as 7.3.23.4.

7.3.23_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.76.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.23_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.23_1.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.23_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing for 5MHz bandwidth

See Table 7.3.23.4.1-1 with the following changes:

- Instead of antenna configuration 2x2 use 2x4.

7.3.23_1.4.2 Test procedure

Same Test Procedure as in 7.3.23.4.2 with the following changes:

- Instead of Table 7.3.23.5-1 use Table 7.3.23_1.5-1

7.3.23_1.4.3 Message contents

Same as 7.3.23.4.3.

7.3.23_1.5 Test requirement

Same test requirement as defined in clause 7.3.23.5 with the following exceptions:

Tables 7.3.1.4.1-1 and 7.3.23_1.5-1 define the primary level settings for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring for 5MHz bandwidth.

Table 7.3.23_1.5-1: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring test #4 under 5MHz Bandwidth

Parameter	Unit	Test 4		
		T1	T2	T3
$BW_{channel}$	MHz	5		
OCNG Pattern defined in A.3.2.1.16 (FDD)		OP.16 FDD		
SNR Note 6, Note 2	dB	-1.4	-4.8	-16.6
Note 1: See Table 7.3.1.5-2 for other cell specific test parameters. Note 2: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1				

7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth

7.3.24.1 Test purpose

Same test purpose as defined in clause 7.3.2.1.

7.3.24.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support bands within band group FDD_N.

7.3.24.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.1.3 with the following exceptions:

- Instead of A.7.3.2 → use A.7.3.24.

7.3.24.4 Test description

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.24.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

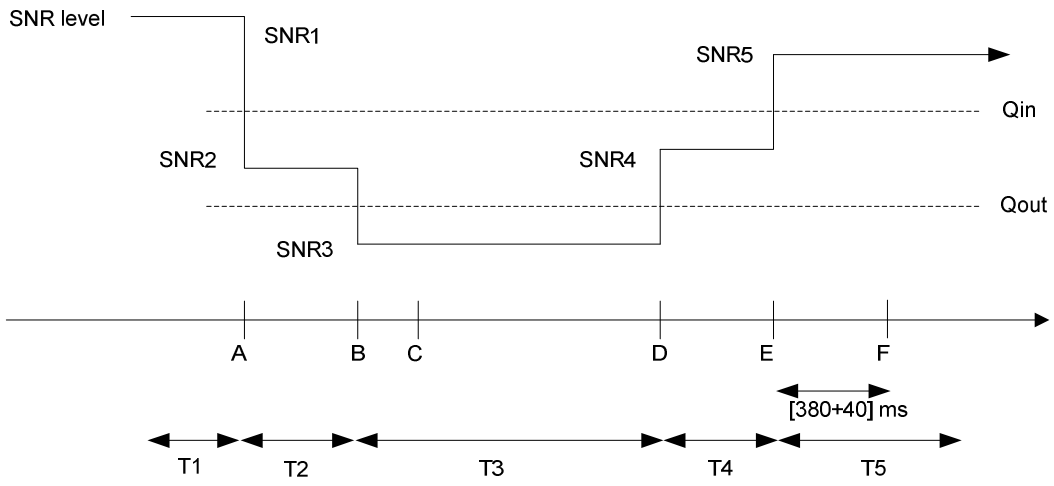

Figure 7.3.24.4-1: SNR variation for in-sync testing

7.3.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.24.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.24.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.24.4.1-1: General test parameters for E-UTRAN FDD in-sync for 5MHz bandwidth testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
In sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
Out of sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: See Table 7.3.2.4.1-1 for other general test 2 parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.24.4.2 Test procedure

Same test procedure as defined in clause 7.3.2.4.2 with only Test 2 applied and with the following exceptions:

- Instead of Table 7.3.2.5-1 → use Table 7.3.24.5-1.

7.3.24.4.3 Message contents

Same message contents as defined in clause 7.3.2.4.3 with only Test 2 applied.

7.3.24.5 Test requirement

Same test requirement as defined in clause 7.3.2.5 with the following exceptions:

Tables 7.3.24.4.1-1 and 7.3.24.5-1 define the primary level settings for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test for 5MHz bandwidth.

Table 7.3.24.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test for 5MHz bandwidth

Parameter	Unit	T1	T2	T3	T4	T5
$BW_{channel}$	MHz	5				
OCNG Pattern defined in D.1.16 (FDD)		OP.16 FDD				
SNR	dB	-1.4	-4.8	-13.1	-8.2	-1.4
Propagation condition		ETU 70 Hz				
Note 1: See Table 7.3.2.5-1 for other general test 2 parameters.						

7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth

7.3.25.1 Test purpose

Same test purpose as defined in clause 7.3.6.1.

7.3.25.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N. Applicability requires support for FGI bit 5.

7.3.25.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.6.3 with the following exceptions:

- Instead of A.7.3.6 → use A.7.3.25.

7.3.25.4 Test description

Same test description as defined in clause 7.3.6.4.

7.3.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.
2. The general test parameter settings for the test are set up according to Table 7.3.25.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.25.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.25.4.1-1: General test parameters for E-UTRAN FDD in-sync in DRX for 5MHz bandwidth testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
In sync transmission parameters(Note 1)	Number of Control OFDM symbols		3	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
Out of sync transmission parameters(Note 1)	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: See Table 7.3.6.4.1-1 for other general test parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.25.4.2 Test procedure

Same test procedure as defined in clause 7.3.6.4.2 with the following exceptions:

- Instead of Table 7.3.6.5-1 → use Table 7.3.25.5-1.

7.3.25.4.3 Message contents

Same message contents as defined in clause 7.3.6.4.3.

7.3.25.5 Test requirement

Same test requirement as defined in clause 7.3.6.5 with the following exceptions:

Tables 7.3.25.4.1-1, 7.3.25.5-1, 7.3.6.5-2 and 7.3.6.5-3 define the primary level settings for E-UTRAN FDD (cell # 1) radio link monitoring test for In-sync in DRX for 5MHz bandwidth.

Table 7.3.25.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring in DRX for 5MHz bandwidth test

Parameter	Unit	T1	T2	T3	T4	T5
$BW_{channel}$	MHz	5				
OCNG Pattern defined in D.1.16 (FDD)		OP.16 FDD				
SNR	dB	-1.7	-5.1	-12.8	-7.9	-1.7
Propagation condition		AWGN				
Note 1: See Table 7.3.6.5-1 for other general test parameters.						

7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.26.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.26.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

7.3.26.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.26.

7.3.26.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.26.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

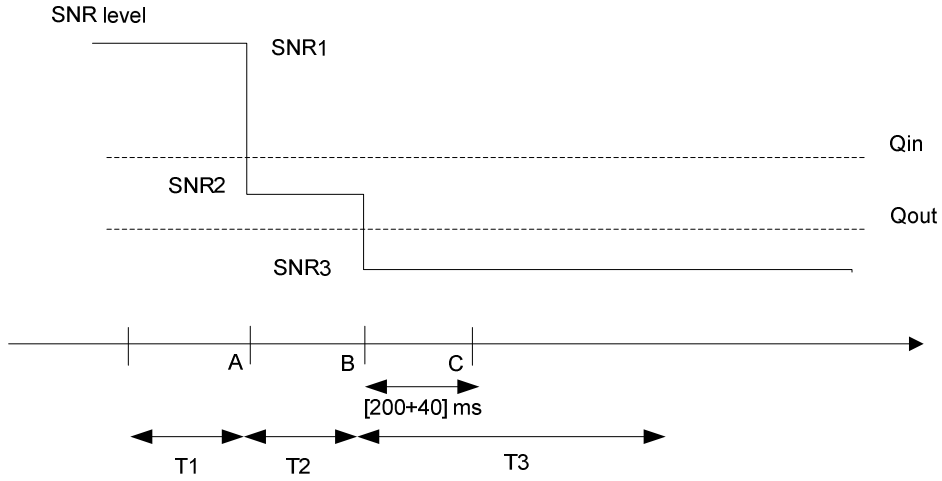

Figure 7.3.26.4-1: SNR variation for out-of-sync testing

7.3.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.26.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.26.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.26.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.26.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.26.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.26.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.26.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.26.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.26.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.26.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.26.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.26.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.26.5 Test requirement

Table 7.3.26.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-1.2	-6.0	-13.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.26.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.26_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis

7.3.26_2.1 Test purpose

The purpose of this test is to verify that the FD-FDD UE Category 1bis UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.26_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

7.3.26_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.26.3 with the following exception:

- Instead of A.7.3.26 use A.7.3.26_2.

7.3.26_2.4 Test description

Same as 7.3.26.4.

7.3.26_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.26_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.26_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.26_2.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test for category 1bis

Same as Table 7.3.26.4.1-1.

7.3.26_2.4.2 Test procedure

Same as 7.3.26.4.2 with the following exception:

- Instead of Table 7.3.26.5-1 use Table 7.3.26_2.5-1.

7.3.26_2.4.3 Message contents

Same as 7.3.26.4.3.

7.3.26_2.5 Test requirement

Table 7.3.26_2.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring for UE Category 1bis

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-1.2	-6.0	-13.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.26_2.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.27.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.27.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0.

7.3.27.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.27.

7.3.27.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.27.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

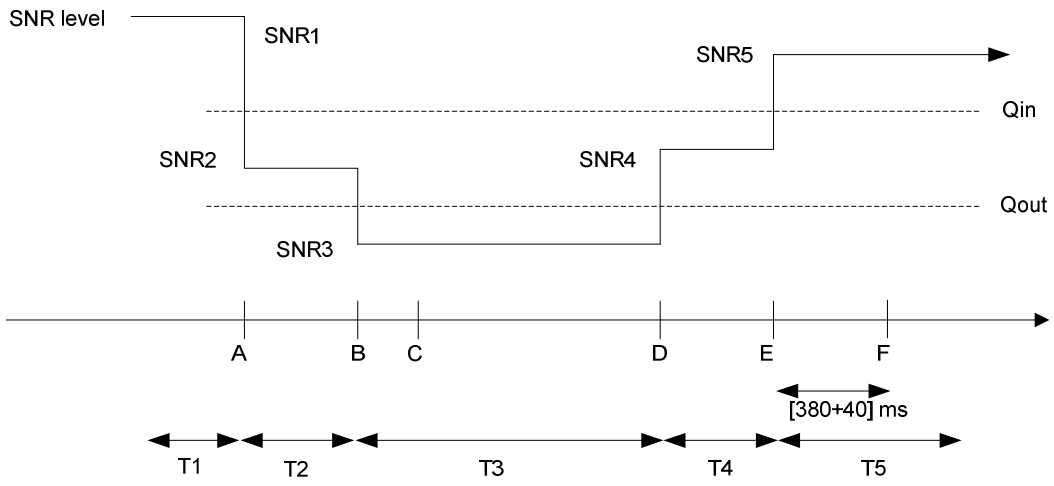

Figure 7.3.27.4-1: SNR variation for in-sync testing

7.3.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.27.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.27.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.27.4.1-1: General test parameters for E-UTRAN FD-FDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			*Enabled*	*Counters: N310 = 1; N311 = 1*
T310 timer		*ms*	*2000*	*T310 is enabled*
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.27.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.27.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.27.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.27.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.27.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.27.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.27.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.27.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.27.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.27.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.27.5 Test requirement

Table 7.3.27.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-1.2	-6.0	-13.8	-8.0	-1.2
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27.1-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.27_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 1bis

7.3.27_2.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.27_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

7.3.27_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.27.3 with the following exception:

Instead of A.7.3.27 use A.7.3.27_2.

7.3.27_2.4 Test description

Same as 7.3.27.4.

7.3.27_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.27_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.27_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.27_2.4.1-1: General test parameters for E-UTRAN FD-FDD Radio Link Monitoring in-sync test for UE Category 1bis

Same as Table 7.3.27.4.1-1.

7.3.27_2.4.2 Test procedure

Same as 7.3.27.4.2 with the following exception:

- Instead of Table 7.3.27.5-1 use Table 7.3.27_2.5-1.

7.3.27_2.4.3 Message contents

Same as 7.3.27.4.3.

7.3.27_2.5 Test requirement

Table 7.3.27_2.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test for UE Category 1bis

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-1.2	-6.0	-13.8	-8.0	-1.2
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27_2.1-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.28.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.28.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.28.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.28.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for FD-FDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ and $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.28.

7.3.28.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.28.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully

synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

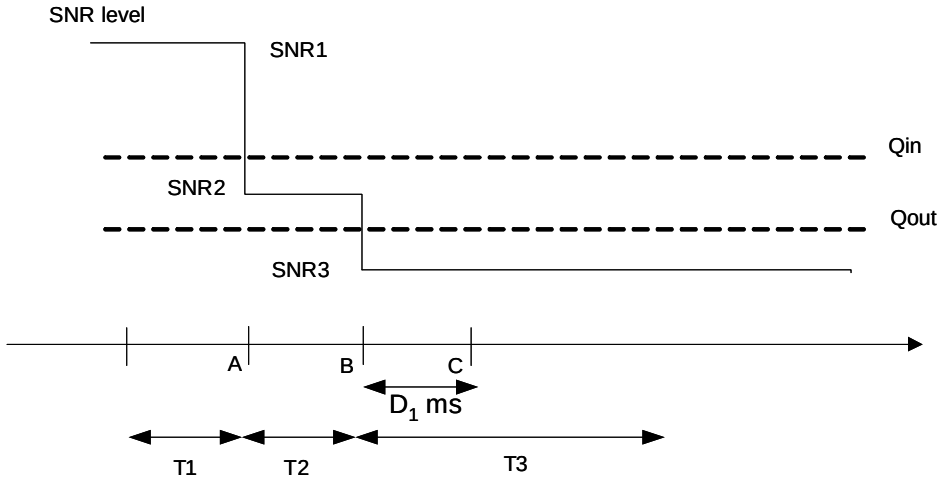

Figure 7.3.28.4-1: SNR variation for out-of-sync testing in DRX

7.3.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.28.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.28.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.28.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	1280	See Table 7.3.28.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.28.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.28.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.28.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.28.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3)

until T3 expires,
the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.28.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.28.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.28.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.28.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.28.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.28.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.28.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.28.5 Test requirement

Table 7.3.28.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.5	-9.4	-14.6
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.28.4-1.

Table 7.3.28.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.28.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.28_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis

7.3.28_2.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.28_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

7.3.28_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.28.3 with the following exception:

Instead of A.7.3.28 use A.7.3.28_2.

7.3.28_2.4 Test description

Same as 7.3.28.4.

7.3.28_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.28_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.28_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.28_2.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test in DRX for category 1bis

Same as Table 7.3.28.4.1-1 with the following exception:

- Instead of Table 7.3.28.5-2 use Table 7.3.28_2.5-2.

7.3.28_2.4.2 Test procedure

Same as 7.3.28.4.2 with the following exception:

- Instead of Table 7.3.28.5-1 use Table 7.3.28_2.5-1.

7.3.28_2.4.3 Message contents

Same as 7.3.28.4.3.

7.3.28_2.5 Test requirement

Table 7.3.28_2.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE Category 1bis

Parameter	Unit	Test 1		
		T1	T2	T3

E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.5	-9.4	-14.6
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.28_2.4-1.

Table 7.3.28_2.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE Category 1bis

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.28_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE Category 1bis

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.29.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.29.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.29.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.29.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for FD-FDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out}\_DRX\_Cat0}$ and $T_{Evaluate\_Q_{in}\_DRX\_Cat0}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.29.

7.3.29.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.29.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

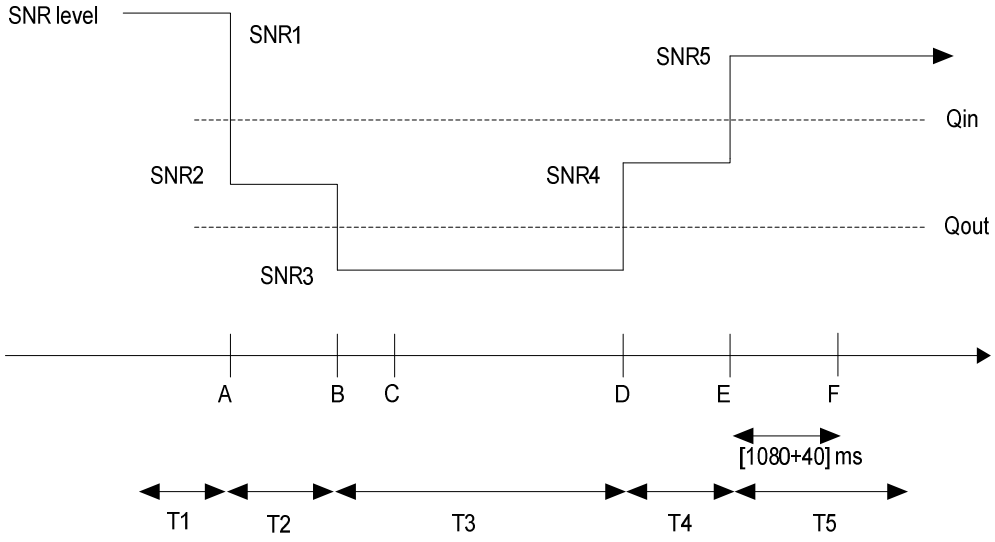

Figure 7.3.29.4-1: SNR variation for in-sync testing in DRX

7.3.29.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.29.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.29.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.29.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE		1	
	Ratio of PCFICH to RS EPRE		1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.29.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.29.5-1. Propagation conditions are set according to Annex B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.29.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.29.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.29.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.29.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.29.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.29.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.29.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.29.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.29.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.29.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.29.5 Test requirement

Table 7.3.29.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-5.5	-9.4	-14.6	-10.7	-5.5
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.29.4-1.

Table 7.3.29.5-2: DRX-Configuration for E-UTRAN FD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.29.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD in-sync radio link monitoring test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.29_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis

7.3.29_2.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.29_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

7.3.29_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.29.3 with the following exception:

Instead of A.7.3.29 use A.7.3.29_2.

7.3.29_2.4 Test description

Same as 7.3.29.4.

7.3.29_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.29_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.29_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.29_2.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for category 1bis

Same as Table 7.3.29.4.1-1 with the following exception:

- Instead of Table 7.3.29.5-2 use Table 7.3.29_2.5-2.

7.3.29_2.4.2 Test procedure

Same as 7.3.29.4.2 with the following exception:

- Instead of Table 7.3.29.5-1 use Table 7.3.29_2.5-1.

7.3.29_2.4.3 Message contents

Same as 7.3.29.4.3.

7.3.29_2.5 Test requirement

Table 7.3.29_2.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test in DRX for UE Category 1bis

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5

E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-5.5	-9.4	-14.6	-10.7	-5.5
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.29_2.4-1.

Table 7.3.29_2.5-2: DRX-Configuration for E-UTRAN FD-FDD in-sync radio link monitoring tests in DRX for UE Category 1bis

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.29_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD in-sync radio link monitoring test in DRX for UE Category 1bis

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.30.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.30.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE Category 0.

7.3.30.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When no DRX is used: The HD-FDD category 0 UE shall meet all applicable requirements specified in TS.36.133 [4] clause 7.11.2.1 under the following conditions

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.30.

7.3.30.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.30.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 10 ms.

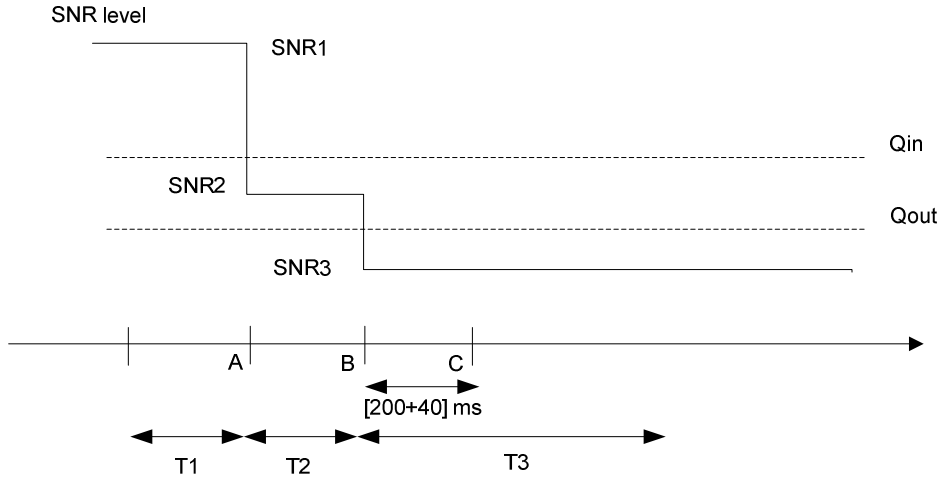

Figure 7.3.30.4-1: SNR variation for out-of-sync testing

7.3.30.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.30.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.30.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.30.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	10	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.30.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.30.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.30.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.30.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.30.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.30.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.30.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	7	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.30.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.30.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.30.5 Test requirement

Table 7.3.30.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in A.2.3		R.4 HD-FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-0.3	-5.1	-12.9
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.30.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.31.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.31.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0.

7.3.31.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When no DRX is used: The HD-FDD category 0 UE shall meet all applicable requirements specified in TS.36.133 [4] clause 7.11.2.1 under the following conditions:

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.31.

7.3.31.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.31.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 10 ms.

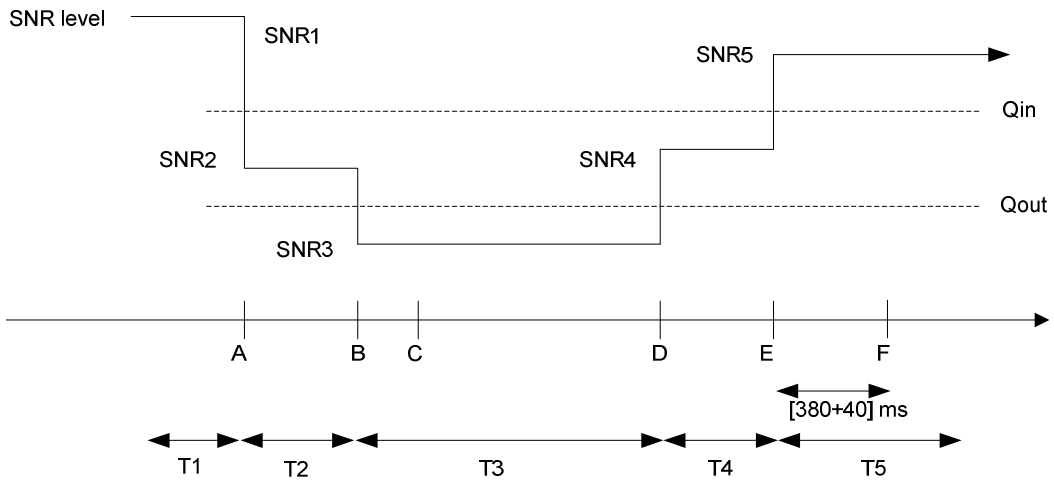

Figure 7.3.31.4-1: SNR variation for in-sync testing

7.3.31.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.31.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.31.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.31.4.1-1: General test parameters for E-UTRAN HD-FDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmis-sion parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmis-sion parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			*Enabled*	*Counters: N310 = 1; N311 = 1*
T310 timer		*ms*	*2000*	*T310 is enabled*
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	10	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.31.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.31.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.31.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.31.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.31.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.31.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.31.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.31.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	7	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.31.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.31.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.31.5 Test requirement

Table 7.3.31.5-1: Cell specific test parameters for E-UTRAN HD-FDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5

E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.3		R.4 HD-FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-0.3	-5.1	-12.9	-7.1	-0.3
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27.1-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.32.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.32.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.32.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) specified in Table 7.3.32.3-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.32.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0.16	Note (20)
0.16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.32.

7.3.32.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.32.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

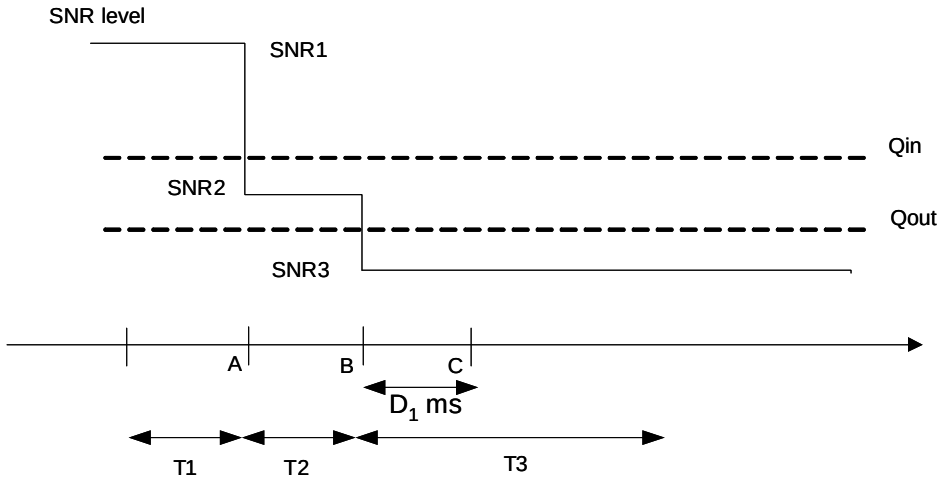

Figure 7.3.32.4-1: SNR variation for out-of-sync testing in DRX

7.3.32.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.32.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.32.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.32.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	1280	See Table 7.3.32.4-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	5	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.32.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.32.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.32.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.32.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.32.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.32.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.32.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	2	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.32.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.32.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.32.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.32.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.32.5 Test requirement

Table 7.3.32.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.3		R.4 HD-FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-4.8	-8.9	-14.1
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.28.4-1.

Table 7.3.32.5-2: DRX-Configuration for E-UTRAN HD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	Psf5	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.32.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.33.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.33.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.33.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) specified in Table 7.3.33.3-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within

$T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.33.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0.16	Note (20)
0.16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.33.

7.3.33.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.29.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

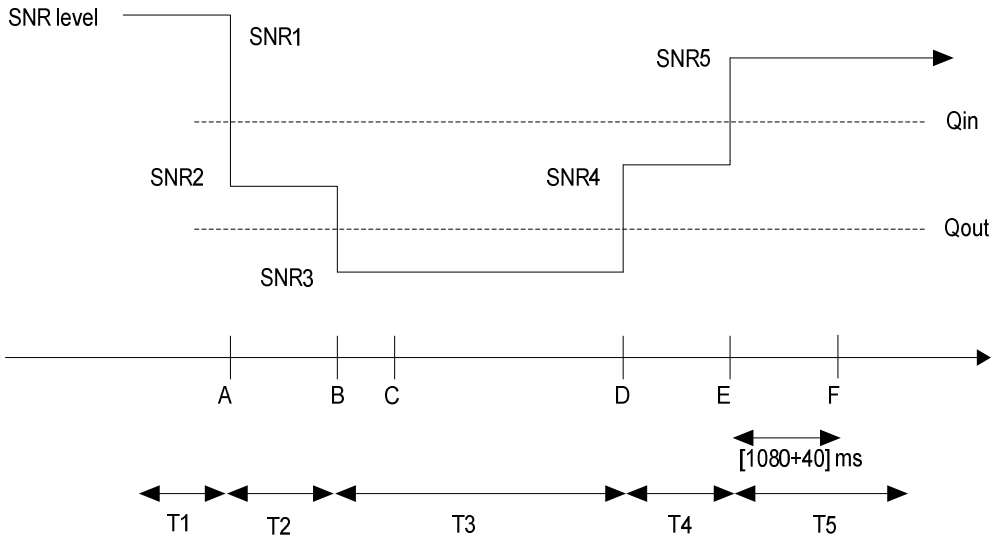

Figure 7.3.33.1-1: SNR variation for in-sync testing in DRX

7.3.33.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.33.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.33.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.33.4.1-1: General test parameters for E-UTRAN HD-FDD in-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE		1	
	Ratio of PCFICH to RS EPRE		1	

Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	5	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.33.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.33.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.33.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.33.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.33.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.33.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.33.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.33.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	2	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.33.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	Psf5		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.33.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.33.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.33.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.33.5 Test requirement

Table 7.3.33.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for In-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters specified in clause A.2.3		R.4 HD-FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-4.8	-8.9	-14.1	-10.0	-4.8
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.33.1-1.

Table 7.3.33.5-2: DRX-Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf5	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.33.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.34.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.34.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE Category 0.

7.3.34.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.34.

7.3.34.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.26.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

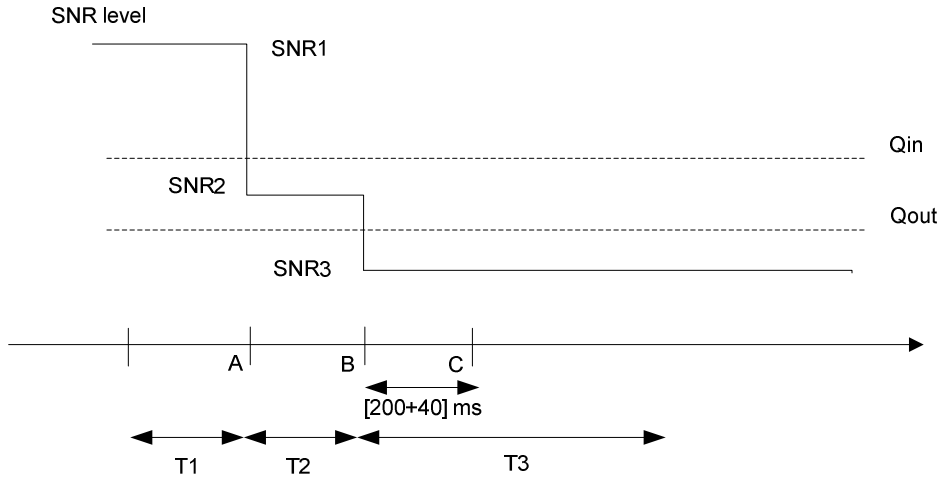

Figure 7.3.34.4-1: SNR variation for out-of-sync testing

7.3.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.34.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.34.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.34.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.34.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.34.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.34.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.34.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.34.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.34.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.34.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.34.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.34.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.34.5 Test requirement

Table 7.3.34.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-0.7	-5.0	-12.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.34.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.34_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis

7.3.34_2.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.34_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

7.3.34_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.34.3 with the following exception:

Instead of A.7.3.34 use A.7.3.34_2.

7.3.34_2.4 Test description

Same as 7.3.34.4.

7.3.34_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.34_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.34_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.34_2.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test for category 1bis

Same as Table 7.3.34.4.1-1.

7.3.34_2.4.2 Test procedure

Same as 7.3.34.4.2 with the following exception:

- Instead of Table 7.3.34.5-1 use Table 7.3.34_2.5-1.

7.3.34_2.4.3 Message contents

Same as 7.3.34.4.3.

7.3.34_2.5 Test requirement

Table 7.3.34_2.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring for UE Category 1bis

Parameter	Unit	Test 1		
		T1	T2	T3

E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-0.7	-5.0	-12.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.34_2.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.35.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.35.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0.

7.3.35.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.35.

7.3.35.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.35.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

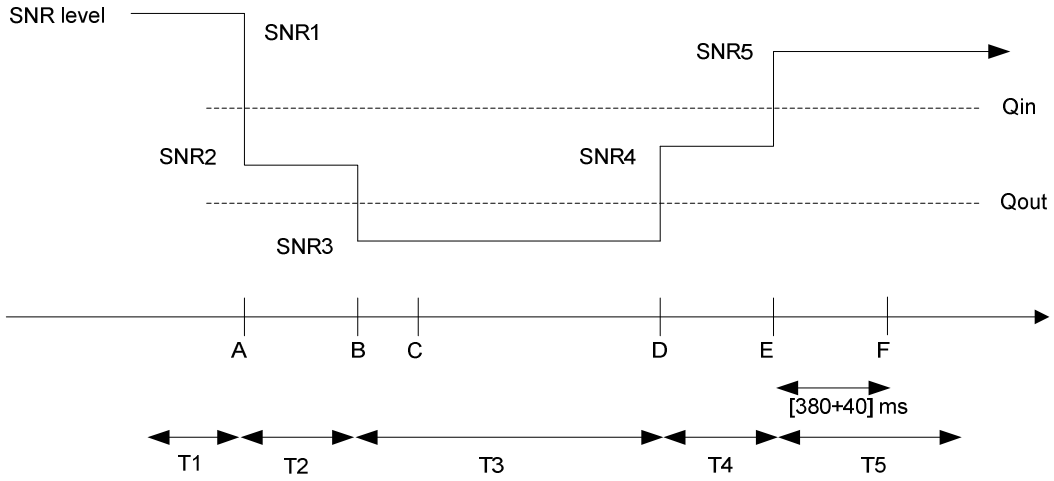

Figure 7.3.35.4-1: SNR variation for in-sync testing

7.3.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.35.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.35.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.35.4.1-1: General test parameters for E-UTRAN TDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmis-sion parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmis-sion parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.35.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.35.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.35.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.35.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.35.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.35.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.35.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.35.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.35.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.35.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.35.5 Test requirement

Table 7.3.35.5-1: Cell specific test parameters for E-UTRAN TDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-0.7	-5.0	-12.8	-7.5	-0.7
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.35.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.35_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE Category 1bis

7.3.35_2.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.35_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis.

7.3.35_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.35.3 with the following exception:

- Instead of A.7.3.35 use A.7.3.35_2.

7.3.35_2.4 Test description

Same as 7.3.35.4.

7.3.35_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.35_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.35_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.35_2.4.1-1: General test parameters for E-UTRAN TDD Radio Link Monitoring in-sync test for UE Category 1bis

Same as Table 7.3.35.4.1-1.

7.3.35_2.4.2 Test procedure

Same as 7.3.35.4.2 with the following exception:

- Instead of Table 7.3.35.5-1 use Table 7.3.35_2.5-1.

7.3.35_2.4.3 Message contents

Same as 7.3.35.4.3.

7.3.35_2.5 Test requirement

Table 7.3.35_2.5-1: Cell specific test parameters for E-UTRAN TDD in-sync Radio Link Monitoring Test for UE Category 1bis

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-0.7	-5.0	-12.8	-7.5	-0.7
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.35_2.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.36.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.36.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.36.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.36.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for TDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ and $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.36.

7.3.36.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.36.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

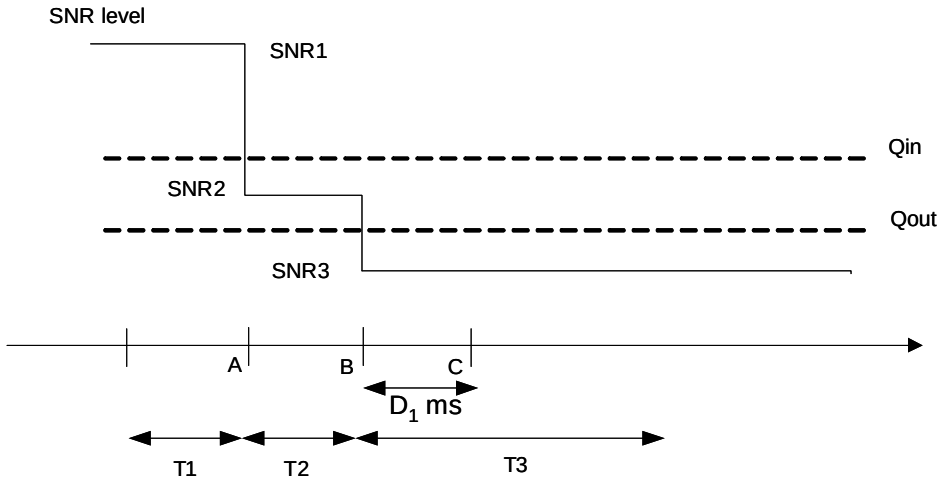

Figure 7.3.36.4-1: SNR variation for out-of-sync testing in DRX

7.3.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.28.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.28.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.36.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	1280	See Table 7.3.28.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.36.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.36.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.36.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.36.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.36.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.36.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.36.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.36.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.36.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.36.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.36.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.36.5 Test requirement

Table 7.3.36.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.0	-9.0	-14.2
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.36.4-1.

Table 7.3.36.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.36.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.36_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis

7.3.36_2.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.36_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE Category 1bis. Applicability requires support for FGI bit 5.

7.3.36_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.36.3 with the following exception:

- Instead of A.7.3.36 use A.7.3.36_2.

7.3.36_2.4 Test description

Same as 7.3.36.4.

7.3.36_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.70.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.70.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.36_2.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test in DRX for category 1bis

Same as Table 7.3.36.4.1-1 with the following exception:

- Instead of Table 7.3.28.1-3 use Table 7.3.70.1-3.

7.3.36_2.4.2 Test procedure

Same as 7.3.36.4.2 with the following exception:

- Instead of Table 7.3.36.5-1 use Table 7.3.36_2.5-1.

7.3.36_2.4.3 Message contents

Same as 7.3.36.4.3.

7.3.36_2.5 Test requirement

Table 7.3.36_2.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE Category 1bis

Parameter	Unit	Test 1		
		T1	T2	T3

E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.0	-9.0	-14.2
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.36_2.4-1.

Table 7.3.36_2.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync test in DRX for UE Category 1bis

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.36_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync test in DRX for UE Category 1bis

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.37.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.37.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.37.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_Cat0}}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_Cat0}}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.37.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for TDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out}\_DRX\_Cat0}$ and $T_{Evaluate\_Q_{in}\_DRX\_Cat0}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.37.

7.3.37.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.37.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

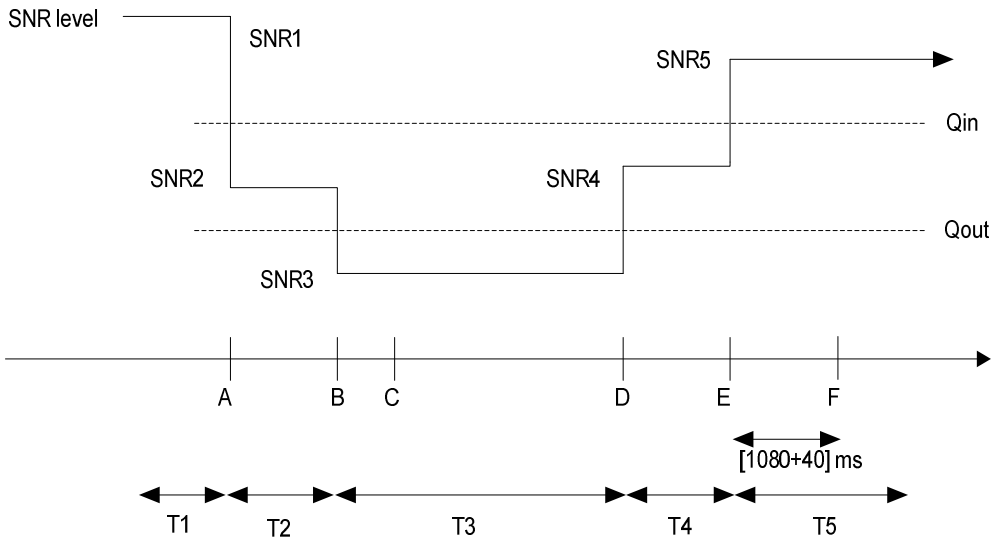

Figure 7.3.37.4-1: SNR variation for in-sync testing in DRX

7.3.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.37.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.37.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.37.4.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE		1	
	Ratio of PCFICH to RS EPRE		1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.37.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.37.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.37.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.37.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.37.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.37.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.37.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.37.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.37.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.37.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.37.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.37.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.37.5 Test requirement

Table 7.3.37.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in section A.2.2		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note2	dB					
OCNG_RB Note2	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 7	dB	-5.0	-9.0	-14.2	-10.2	-5.0
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.37.4-1.

Table 7.3.37.5-2: DRX-Configuration for E-UTRAN TDD in-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf40	
shortDRX	disable	

Table 7.3.37.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD in-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.37_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis

7.3.37_2.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.37_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

7.3.37_2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.37.3 with the following exception:

- Instead of A.7.3.37 use A.7.3.37_2.

7.3.37_2.4 Test description

Same as 7.3.37.4.

7.3.37_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.37_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.37_2.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.37_2.4.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX for category 1bis

Same as Table 7.3.37.4.1-1 with the following exception:

- Instead of Table 7.3.29.1-3 use Table 7.3.71.1-3.

7.3.37_2.4.2 Test procedure

Same as 7.3.37.4.2 with the following exception:

- Instead of Table 7.3.37.5-1 use Table 7.3.37_2.5-1.

7.3.37_2.4.3 Message contents

Same as 7.3.37.4.3.

7.3.37_2.5 Test requirement

Table 7.3.37_2.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test in DRX for UE Category 1bis

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5

E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in section A.2.2		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note2	dB					
OCNG_RB Note2	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 7	dB	-5.0	-9.0	-14.2	-10.2	-5.0
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.37_2.4-1.

Table 7.3.37_2.5-2: DRX-Configuration for E-UTRAN TDD in-sync test in DRX for UE Category 1bis

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf40	
shortDRX	disable	

Table 7.3.37_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD in-sync test in DRX for UE Category 1bis

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

7.3.38.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.38.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity.

7.3.38.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.38.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.38.

7.3.38.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.38.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

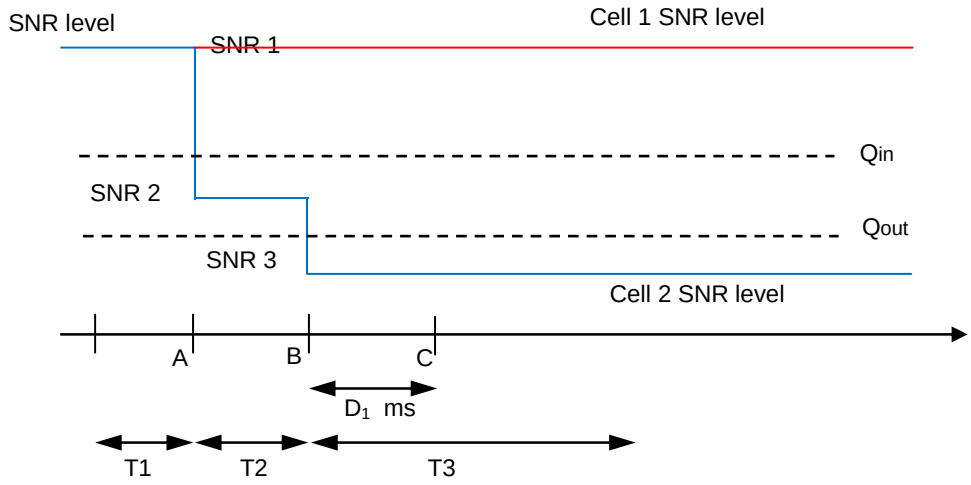

Figure 7.3.38.4-1 SNR variation for out-of-sync testing in DRX

7.3.38.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.38.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.38.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.38.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.38.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.38.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.38.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.38.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.38.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.38.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.38.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and

b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,

the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.38.5-1.
9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.
10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.38.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.38.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.38.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.38.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.38.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.38.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.38.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.38.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.38.5 Test requirement

Table 7.3.38.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-13.1
SNR Note 6 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-13.1
SNR Note 6 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.0	-5.9	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μs	-			33		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.38.4-1.

Table 7.3.38.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.38.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.38_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with 4 Rx antenna ports

7.3.38_1.1 Test purpose

Same test purpose as defined in clause 7.3.38.1.

7.3.38_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity and 4Rx on all its FDD operating bands.

7.3.38_1.3 Minimum conformance requirements

Same as 7.3.38.3.

7.3.38_1.4 Test description

Same as 7.3.38.4.

7.3.38_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.73 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.38_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.38_1.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.38_1.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

See Table 7.3.38.4.1-1 with the following changes:

- Instead of antenna configuration 2x2 low use 2x4low.

7.3.38_1.4.2 Test procedure

Same Test Procedure as in 7.3.38.4.2 with the following changes:

- Instead of Table 7.3.38.5-1 use Table 7.3.38_1.5-1

7.3.38_1.4.3 Message contents

Same as 7.3.38.4.3.

7.3.38_1.5 Test requirement

Table 7.3.38_1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x4 Low			2x4 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6, Note 7 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-16.6
SNR Note 6, Note 7 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-16.6
SNR Note 6, Note 7 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.0	-5.9	-17.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μs	-			33		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.38.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.38.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.38.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

7.3.39.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX in asynchronous dual connectivity is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.39.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports asynchronous Dual Connectivity.

7.3.39.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.39.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.39.

7.3.39.4 Test description

There are two cells, cell 1 is PCell in MCG and cell 2 is PSCell in SCG, in the test. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure 7.3.39.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

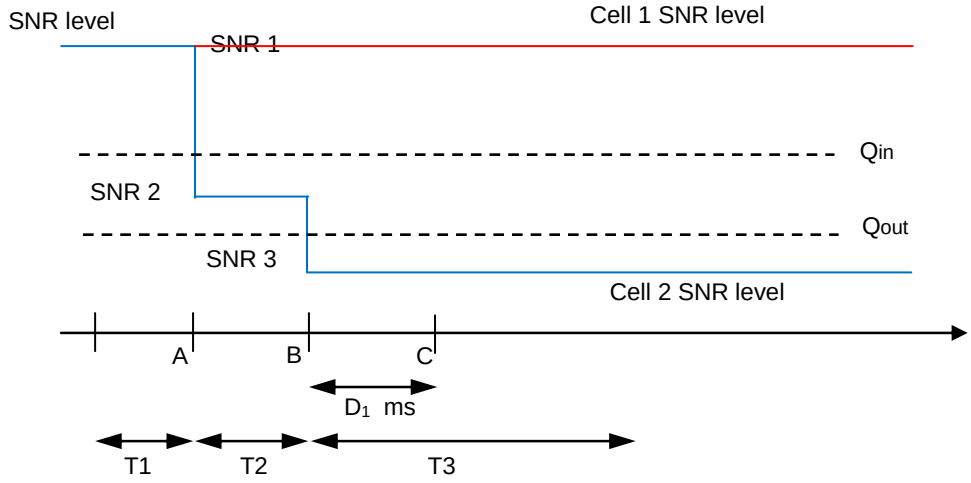

Figure 7.3.39.4-1: SNR variation for out-of-sync testing in DRX

7.3.39.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.39.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.39.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.39.4.3

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.39.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.39.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.39.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.39.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF_DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.39.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.39.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.39.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.39.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.39.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.39.4.3 Message contents

Same message contents as defined in clause 7.3.38.4.3.

7.3.39.5 Test requirement

Table 7.3.39.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-13.1
SNR Note 6 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-13.1
SNR Note 6 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.0	-5.9	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Receive time offset to cell1 Note 7	μs	-			500		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.39.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.39.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.39.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink on cell 1 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

During the period from time point A to time point B the UE shall transmit uplink signal on cell 2 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal on cell 2 no later than time point C (duration D1 = 900 ms after the start of time duration T3).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.39_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC with 4 Rx antenna ports

7.3.39_1.1 Test purpose

Same test purpose as defined in clause 7.3.39.1.

7.3.39_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports asynchronous Dual Connectivity and 4Rx on all its FDD operating bands.

7.3.39_1.3 Minimum conformance requirements

Same as 7.3.39.3.

7.3.39_1.4 Test description

Same as 7.3.39.4.

7.3.39_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.73 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.39_1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.39_1.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.39_1.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

See Table 7.3.39_1.4.1-1 with the following changes:

- Instead of antenna configuration 2x2 low use 2x4low.

7.3.39_1.4.2 Test procedure

Same Test Procedure as in 7.3.39.4.2 with the following changes:

- Instead of Table 7.3.39.5-1 use Table 7.3.39_1.5-1

7.3.39_1.4.3 Message contents

Same as 7.3.39.4.3.

7.3.39_1.5 Test requirement

Table 7.3.39_1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x4 Low			2x4 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6, Note 8 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-16.6
SNR Note 6, Note 8 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-16.6
SNR Note 6, Note 8 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.0	-5.9	-17.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Receive time offset to cell1 Note 7	μs	-			500		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.39.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.
Note 8: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.39.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.39.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink on cell 1 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

During the period from time point A to time point B the UE shall transmit uplink signal on cell 2 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal on cell 2 no later than time point C (duration D1 = 900 ms after the start of time duration T3).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

7.3.40.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.40.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Dual Connectivity.

7.3.40.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.40.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.40.

7.3.40.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.40.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

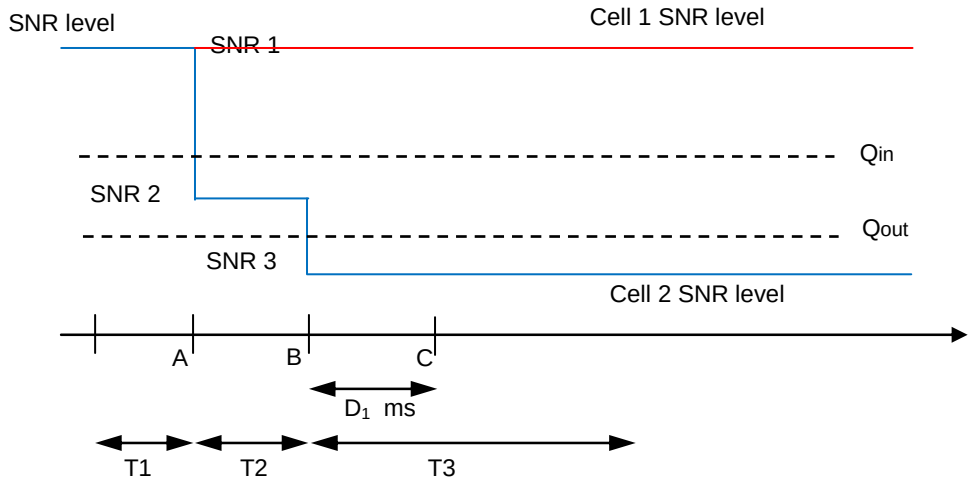

Figure 7.3.40.4-1 SNR variation for out-of-sync testing in DRX

7.3.40.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.40.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.40.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.40.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.40.4.1-1: General test parameters for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA TDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.40.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.40.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.40.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF_DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.40.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.40.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.40.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.40.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   The number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.40.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.40.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.40.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.40.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.40.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.40.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.40.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.38.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 7.3.40.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.40.5 Test requirement

Table 7.3.40.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD			5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD		
OCNG Pattern		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 8] (5MHz bandwidth)	dB	-0.7	-0.7	-0.7	-0.7	-4.3	-12.8
SNR [Note 8] (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.0	-12.8
SNR [Note 8] (20MHz bandwidth)	dB	-2.1	-2.1	-2.1	-2.1	-5.7	-13.5
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μs	-			33		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.40.41-1.

Table 7.3.40.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.40.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

7.3.41.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.41.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity.

7.3.41.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.41.

7.3.41.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.38.4-1 shows the variation of the downlink SNR in the PSCell to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

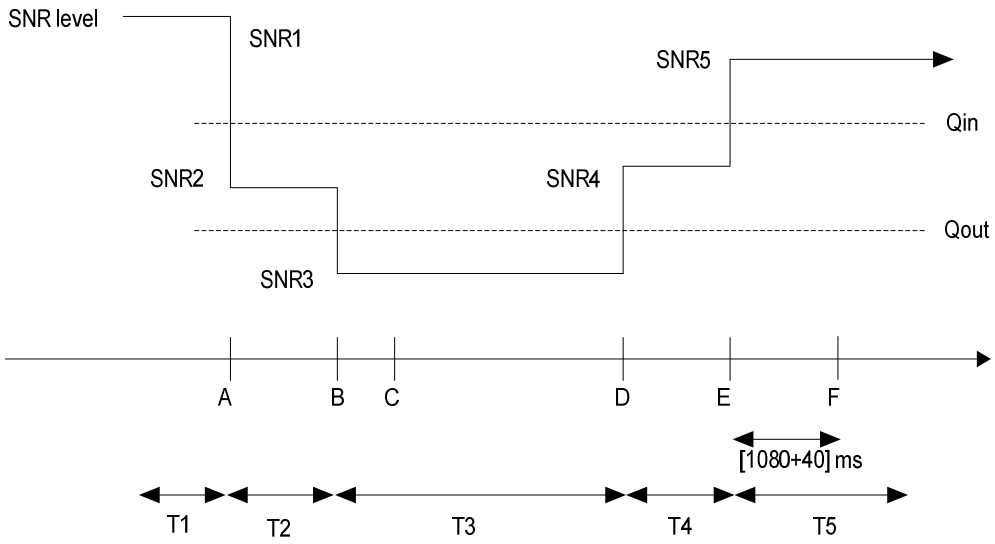

Figure 7.3.41.4-1: SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.41.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.41.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.41.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.41.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.41.4.1-1: General test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.41.5-2
DRX cycle on Cell 2		ms	40	See Table A.7.3.41.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5				

7.3.41.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.41.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.41.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.41.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.41.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.41.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.41.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.41.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.41.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.41.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.41.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.41.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.41.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.41.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.41.4.3-7: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.41.5 Test requirement

Table 7.3.41.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter	Unit	Cell 1(PCell)	Cell 2 (PSCell)				
		T1 ~ T5	T1	T2	T3	T4	T5

E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
PCFICH/PDCCH/PHICH parameters defined in A.2.1			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern defined in D.1 (FDD)			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA[Note1]		dB						
OCNG_RB[Note1]		dB						
SNR [Note 6]	5MHz $BW_{channel}$	dB	-1.7	-1.7	-5.1	-12.8	-7.9	-1.7
	10MHz $BW_{channel}$		-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
	20MHz $BW_{channel}$		-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 [Note 7]		μs	-	33				

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR of cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.41.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.41.5-2: DRX-Configuration for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.41.5-3: TimeAlignmentTimer Configuration for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value	
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC

7.3.42.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in asynchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

7.3.42.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports asynchronous Dual Connectivity.

7.3.42.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.42.

7.3.42.4 Test description

There are two cells in the test. Cell 1 is PCell in MCG and cell 2 is PSCell in SCG. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure 7.3.42.4-1 shows the variation of the downlink SNR in cell 2 to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2 in asynchronous dual connectivity. For both cell 1 and cell 2, the UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

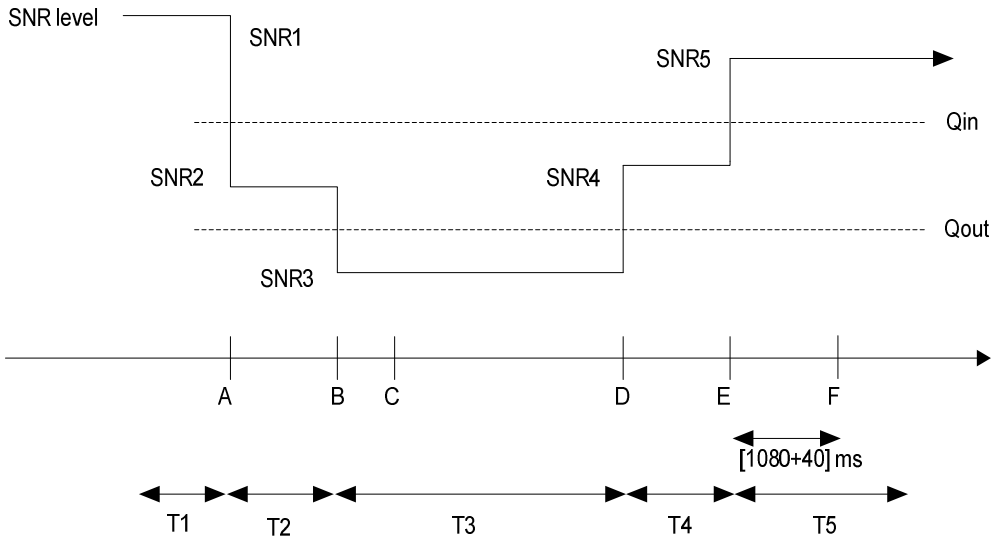

Figure 7.3.42.4-1: Cell 2 SNR variation for in-sync testing in DRX

7.3.42.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.42.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.42.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.42.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.42.4.1-1: General test parameters for E-UTRAN FDD-FDD Radio Link Monitoring in-sync test in DRX dual connectivity

Parameter		Unit	Value	Comment
Active cells			Cell 1 and cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
Antenna Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	

DRX cycle in cell 1	ms	640	See Table 7.3.42.5-2
DRX cycle in cell 2	ms	40	See Table 7.3.42.5-2
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
T313 timer	ms	2000	T313 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	Minimum CQI reporting periodicity
T1	s	4	
T2	s	1.6	
T3	s	1.46	
T4	s	0.4	
T5	s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: The parameters in the table apply to both cell 1 and cell 2 unless defined otherwise. Note 3: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.			

7.3.42.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.42.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.42.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.42.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.42.5-1. T3 starts.

7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.42.5-1. T4 starts.

8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.42.5-1. T5 starts.

9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.42.4.3 Message contents

Same message contents as defined in clause 7.3.41.4.3.

7.3.42.5 Test requirement

Table 7.3.42.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in asynchronous dual connectivity

Parameter		Unit	Cell 1 (PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5, 10, 20	5, 10, 20				
PCFICH/PDCCH/PHICH parameters. None of the PDCCH are intended for the UE under test.			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note1		dB						
OCNG_RB Note1		dB						
SNR Note 6	5MHz $BW_{channel}$	dB	-1.7	-1.7	-5.1	-12.8	-7.9	-1.7
	10MHz $BW_{channel}$	dB	-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
	20MHz $BW_{channel}$	dB	-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN					
Receive time offset to cell1 Note 7		µs	-	500				

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR of cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.42.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.42.1-3: DRX-Configuration for E-UTRAN FDD In-sync tests

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.42.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD In-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5].
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

7.3.43.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

7.3.43.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Dual Connectivity.

7.3.43.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.43.

7.3.43.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.43.4-1 shows the variation of the downlink SNR in the PSCell to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

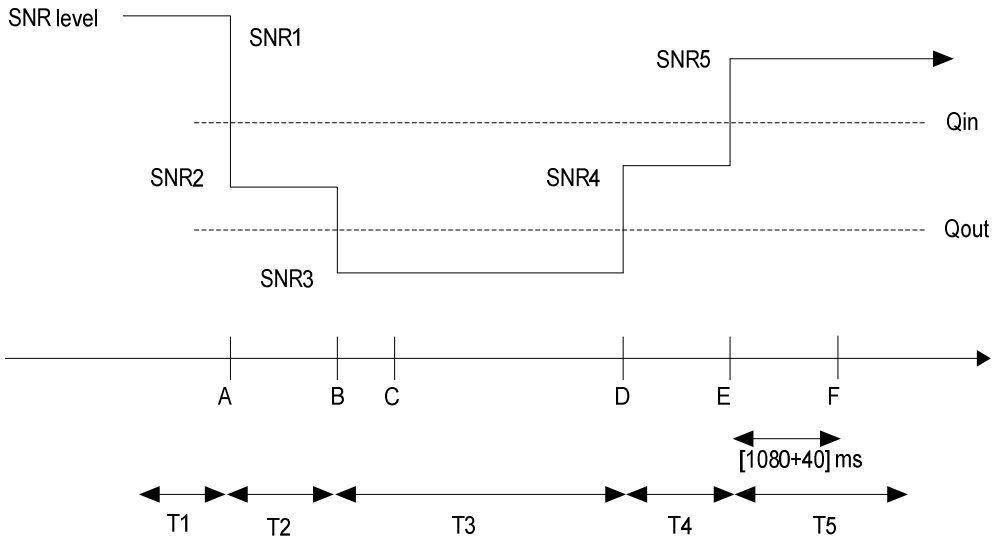

Figure 7.3.43.4-1: SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.43.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.43.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.43.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.43.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.43.4.1-1: General test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two E-UTRA TDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table A.7.3.43.1-3
DRX cycle on Cell 2		ms	40	See Table A.7.3.43.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.43.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.43.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.43.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.43.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.43.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.43.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.43.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.43.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.43.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.43.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.43.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.43.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.43.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.43.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.43.4.3-7: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.43.5 Test requirement

Table 7.3.43.5-1: Cell specific test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter		Unit	Cell 1(PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration Note1			6	6				
Uplink-downlink configuration Note2			1	1				
PCFICH/PDCCH/PHICH parameters defined in A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Pattern defined in D.2 (TDD)			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note1		dB						
OCNG_RB Note1		dB						
SNR Note 6	5MHz $BW_{channel}$	dB	-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
	10MHz $BW_{channel}$		-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
	20MHz $BW_{channel}$		-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 Note 9		μs	-	33				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.43.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.43.5-2: DRX-Configuration for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.43.5-3: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.44 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

7.3.44.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.44.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.44.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.44.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.44.

7.3.44.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.44.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

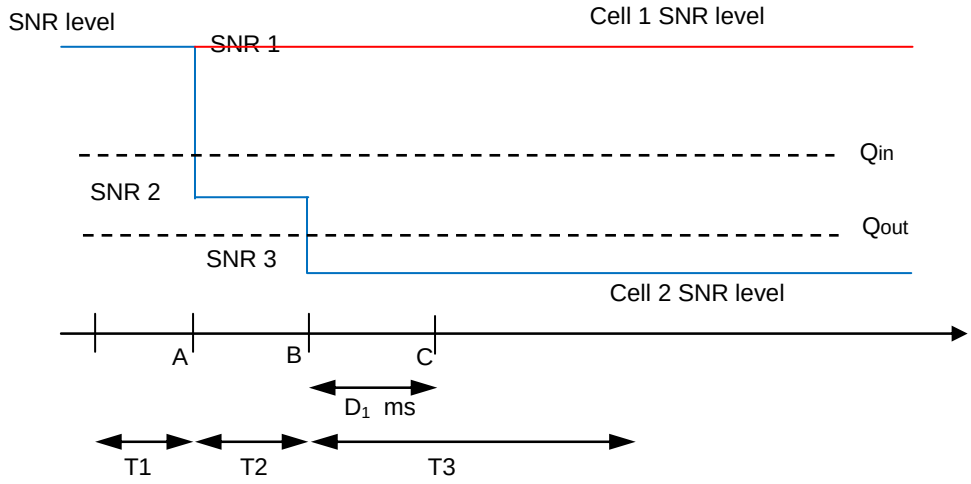

Figure 7.3.44.4-1 SNR variation for out-of-sync testing in DRX

7.3.44.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.44.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.44.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.44.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.44.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA FDD RF channel number 1, and cell 2 is PSCell on E-UTRA TDD RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	One E-UTRA FDD carrier frequency and one E-UTRA TDD carrier frequency are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.44.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.44.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.44.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.44.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.44.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.44.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.44.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.44.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.44.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.44.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.44.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for Cell 1 (FDD)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.44.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.44.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.44.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.44.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.44.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.44.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.44.5 Test requirement

Table 7.3.44.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note7]		-			6		
Uplink-downlink configuration[Note8]		-			1		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR [Note 6] (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-0.7	-4.3	-12.8
SNR [Note 6] (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.0	-12.8
SNR [Note 6] (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.1	-5.7	-13.5
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1 [Note 9]	μs	-			33		
CQI reporting periodicity	ms	2			1		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.38.1-1.
Note 7: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 8: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.44.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.44.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.45 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

7.3.45.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.45.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.45.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.45.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)

Note 1: Evaluation period length in time depends on the length of the DRX cycle in use.
Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.45.

7.3.45.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.45.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

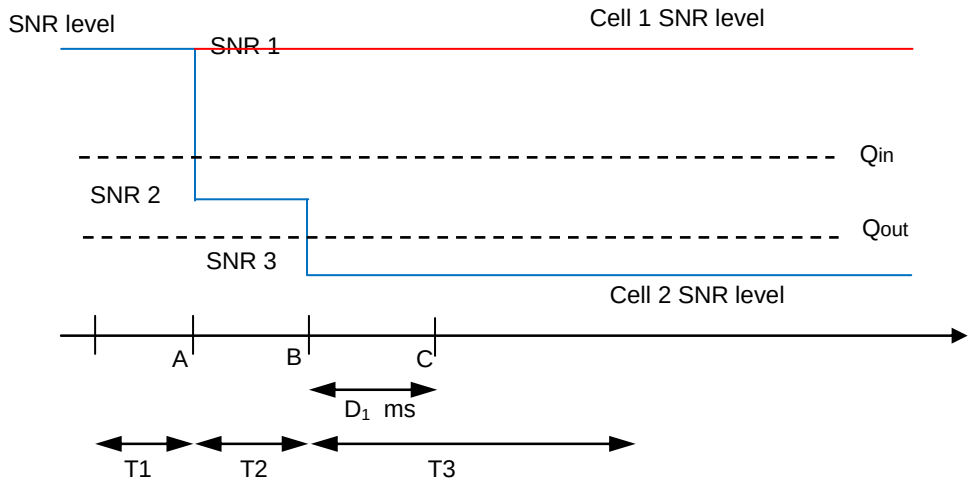

Figure 7.3.45.4-1 SNR variation for out-of-sync testing in DRX

7.3.45.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.45.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.45.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.45.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.45.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA TDD RF channel number 1, and cell 2 is PSCell on E-UTRA FDD RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	One E-UTRA TDD carrier frequency and one E-UTRA FDD carrier frequency are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.45.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.45.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.45.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.45.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.45.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.45.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.45.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.
   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.45.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.45.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.45.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.45.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for Cell 1 (FDD)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.45.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.45.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.45.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.45.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.45.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.45.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.45.5 Test requirement

Table 7.3.45.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			-		
Uplink-downlink configuration[Note2]		1			-		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 8] (5MHz bandwidth)	dB	-0.7	-0.7	-0.7	-1.4	-4.8	-13.1
SNR [Note 8] (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.1	-13.1
SNR [Note 8] (20MHz bandwidth)	dB	-32.1	-2.1	-2.1	-2.0	-5.7	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1 [Note 9]	μs	-			33		
CQI reporting periodicity	ms	1			2		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.40.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.45.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.45.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.46 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD

7.3.46.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.46.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.46.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.46.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.46.

7.3.46.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.46.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

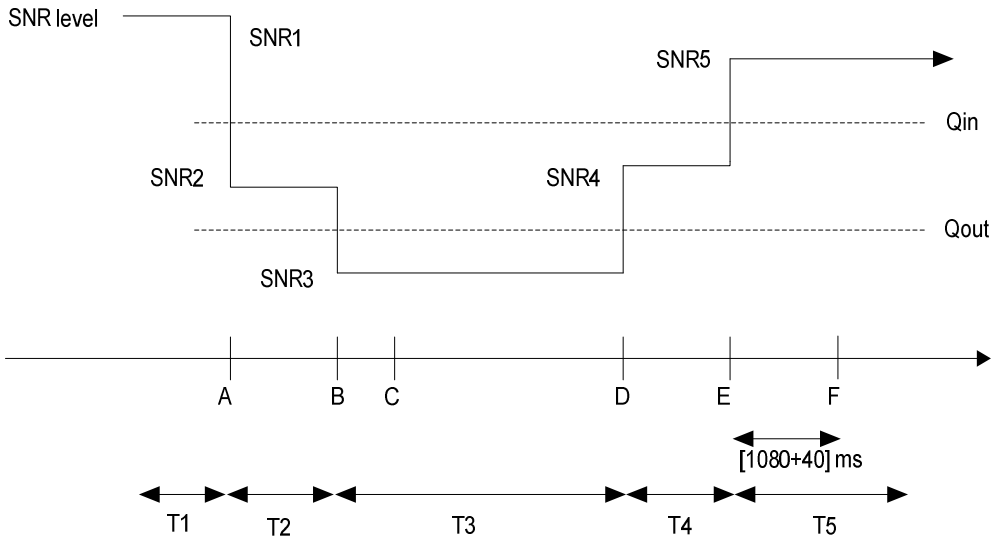

Figure 7.3.46.4-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.46.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.46.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.46.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.46.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.46.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One E-UTRA FDD carrier frequency and One E-UTRA TDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA FDD RF channel number 1, and cell 2 is PSCell on E-UTRA TDD RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.46.5-2
DRX cycle on Cell 2		ms	40	See Table 7.3.46.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.46.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.46.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.61.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.46.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.46.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.46.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.46.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.46.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.46.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.46.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.46.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.46.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.46.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.46.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.46.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.46.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.46.5 Test requirement

Table 7.3.46.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Parameter		Unit	Cell 1(PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration Note1			-	6				
Uplink-downlink configuration Note2			-	1				
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1 and A.3.1.2.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Pattern defined in A.3.2.1 (FDD) and A.3.2.2 (TDD)			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note3		dB						
OCNG_RB Note3		dB						
SNR Note 8	5MHz $BW_{channel}$	dB	-1.7	-4.5	-8.5	-13.7	-9.7	-4.5
	10MHz $BW_{channel}$		-4.1	-4.5	-8.5	-13.7	-9.7	-4.5
	20MHz $BW_{channel}$		-4.1	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 Note 9		μs	-	33				
CQI reporting periodicity		ms	2	1				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR of Cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.46.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.46.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.46.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.47 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD

7.3.47.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133 [4] clause 7.6.

7.3.47.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.47.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Q_{out\_DRX}}$) and the Q_{in} evaluation period ($T_{Evaluate\_Q_{in\_DRX}}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Q_{in\_DRX}}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max (10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.47.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out}\_DRX}$ and $T_{Evaluate\_Q_{in}\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.47.

7.3.47.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.47.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

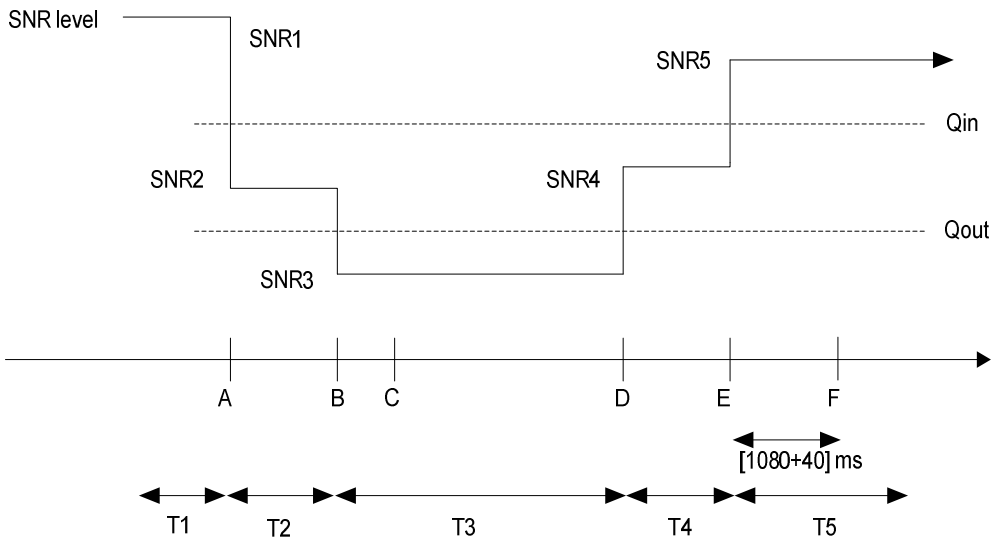

Figure 7.3.47.4-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.47.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.47.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.47.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.47.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.47.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One E-UTRA TDD carrier frequency and One E-UTRA FDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA TDD RF channel number 1, and cell 2 is PSCell on E-UTRA FDD RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.47.5-2
DRX cycle on Cell 2		ms	40	See Table 7.3.47.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.47	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.47.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.47.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.61.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.47.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.47.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.47.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.47.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.47.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.47.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.47.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.47.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.47.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.47.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.47.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.47.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.47.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.47.5 Test requirement

Table 7.3.47.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Cell 1(PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration[Note1]			6	-				
Uplink-downlink configuration[Note2]			1	-				
PCFICH/PDCCH/PHICH parameters defined in A 2.1 and A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern defined in D.1 (FDD) and D.2 (TDD)			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA[Note1]		dB						
OCNG_RB[Note1]		dB						
SNR [Note 6]	5MHz $BW_{channel}$	dB	-4.5	-1.7	-5.1	-12.8	-7.9	-1.7
	10MHz $BW_{channel}$		-4.5	-4.1	-8.9	-14.1	-9.3	-4.1
	20MHz $BW_{channel}$		-4.5	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 [Note 9]		μs	-	33				
CQI reporting periodicity		ms	1	2				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR of Cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.47.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.47.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.47.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEMode A

7.3.48.1 Test purpose

The purpose of this test is to verify that the FD-FDD CE UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN FDD radio link monitoring requirements for CE UE defined in clause 7.19.

7.3.48.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.48.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.48.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.48.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 2 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the *RRC parameter mPDCCH-NumRepetition* is set to 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

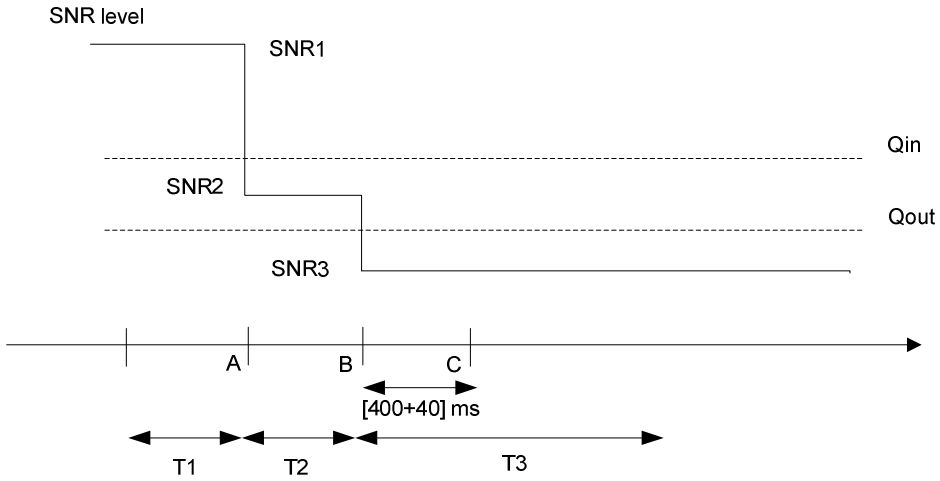

Figure 7.3.48.4-1: SNR variation for out-of-sync testing

7.3.48.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.48.4.1-1.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.48.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.48.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4]
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repetition level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.48.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.48.4.1-1.
3. Set the parameters according to T1 in Table 7.3.48.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.48.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.48.5-1. T3 starts.
6. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires; the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.48.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CEModeA activated according to TS 36.508 [7] clause 7.2A.3AA.
9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.48.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.48.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.48.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	Not Present	(see Clause 7.2.2 in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.48.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

7.3.48.5 Test requirement

Table 7.3.48.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests for CE UE in CEMode A

Parameter	**Unit**	**Test 1**		
		T1	**T2**	**T3**
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters as defined in A. 7.1		R.17 FDD		
OCNG Pattern defined in D.1		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	1.0	-5.9	-16.7
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.48.4.1-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for CE UE in CEModeA

7.3.49.1 Test purpose

The purpose of this test is to verify that the FD-FDD CE UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN FDD radio link monitoring requirements for CE UE defined in clause 7.19.

7.3.49.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.49.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.49.

7.3.49.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.49.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully

synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 2 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the *RRC parameter mPDCCH-NumRepetition* is set to 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

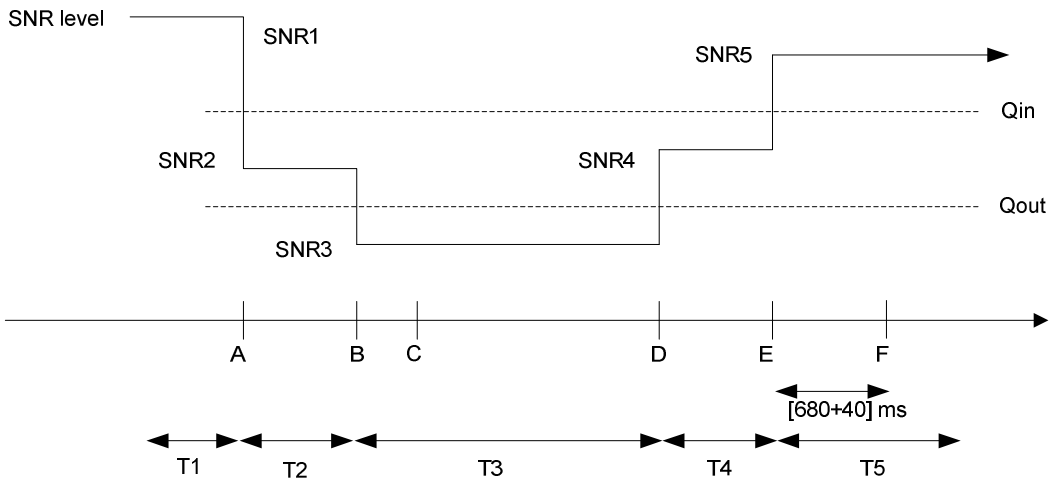

Figure 7.3.49.4-1: SNR variation for in-sync testing

7.3.49.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.49.4.1-1.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.49.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.49.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4].
	M-PDCCH aggregation level	eCCE	4	
	M-PDCCH repetition level		2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4].
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repetition level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.49.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.49.4.1-1.
3. Set the parameters according to T1 in Table 7.3.49.5-1. Propagation conditions are set according to Annex B.2. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.49.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.49.5-1. T3 starts.
6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.49.5-1. T4 starts.
7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.49.5-1. T5 starts.
8. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (680+40 ms after the start of time duration T5) the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved

7.3.49.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.49.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.49.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	Not Present	(see Clause 7.2.2 in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.49.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r4		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

Table 7.3.49.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.49.5 Test requirement

Table 7.3.49.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring tests for CE UE in CEModeA

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters as defined in A. 7.1		R.17 FDD				
OCNG Pattern defined in D.1		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	6.3	-2.9	-13.7	-2.5	6.3
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.49.4.1-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F ((680+40) ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.50 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

7.3.50.1 Test purpose

The purpose of this test is to verify that the FD-FDD CE UE configured in CEModeA properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in TS 36.133 Section 7.19 [4].

7.3.50.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.50.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE Cat-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out\_Cat\ M1}$ and $Q_{in\_Cat\ M1}$ for the purpose of monitoring downlink radio link quality of the PCell.

When DRX is used for FD-FDD and TDD category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.50.3-1 (TS 36.133 [4] Table 7.19.2.2-1) will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.50.3-2 (TS 36.133 [4] Table 7.19.2.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max (10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.50.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.50.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.50.

The test parameters are given in Tables 7.3.50.4.1-1, 7.3.50.5-1, 7.3.50.5-2 and 7.3.50.5-3.

7.3.50.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.50.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync states.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the RRC parameter *mPDCCH-NumRepetition* is set 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

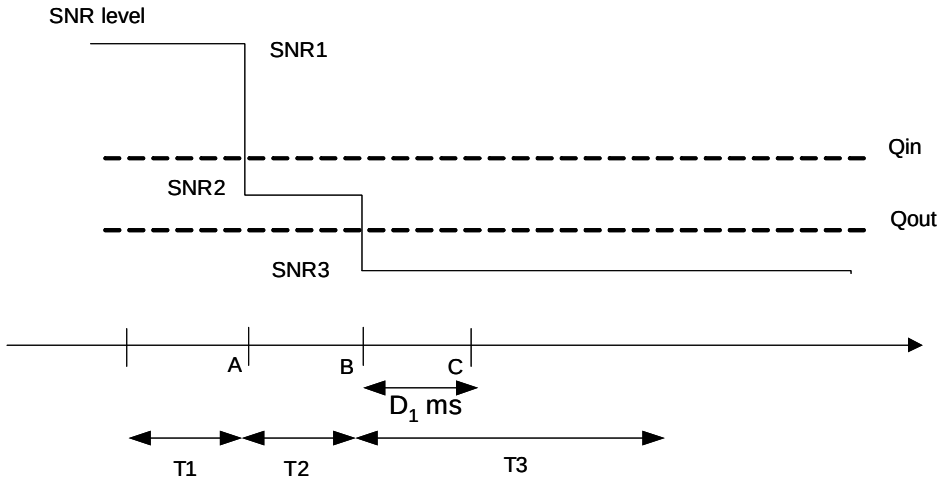

Figure 7.3.50.4-1: SNR variation for out-of-sync testing in DRX

7.3.50.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.50.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.50.4.3.
5. There is one cell and one E-UTRA FD-FDD carrier specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.50.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync tests in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212 [31]
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out,\ Cat\ M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in TS 36.133 [4] clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	16	
	MPDCCH repetition level		4	
	Ratio of MPDCCH to RS EPRE		0	
	ρ_A, ρ_B		-3	
DRX cycle		Ms	1280	See Table 7.3.50.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		Ms	0	T310 is disabled
T311 timer		Ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		Ms	2	Minimum CQI reporting periodicity
T1		S	32	
T2		S	12.8	
T3		S	13	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.50.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.50.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.50.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.50.5-1. T3 starts.

5. If the SS a) detects uplink power equal to or higher than -39 dBm for carrier frequency less than 3GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1[10] clause 6.3.2.5) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B, and b) does not detect any uplink power higher than -48.5 dBm for carrier frequency less than 3GHz) or higher than -48.2 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.3.5) from time point C (6500 ms (D1) after the start of T3) until T3 expires, then the number of successful tests is increased by one. Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.50.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.50.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.50.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.50.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-	
1B and clause 7.2.2 in TS 36.213 [8])			
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.50.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.50.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.50.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.50.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.50.5 Test requirement

Table 7.3.50.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for CE UE in CEModeA

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters defined in A. 7.1		R.17 FDD Note 7		
OCNG Pattern defined in D.1		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	0.97	-6.38	-15.58
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.50.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.50.4.1-1 are used for this test.

Table 7.3.50.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for CE UE in CEModeA

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.50.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync testing in DRX for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	30	For further information see clause 6.3.2 in TS 36.331 [5] and section 10.1 in TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm for f<3GHz or -38.7 dBm for 3.0GHz < f ≤ 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal,

- UE output power equal to or less than Transmit OFF power -48.5 dBm for f<3GHz or -48.2dBm for 3.0GHz < f ≤ 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEMode A

7.3.51.1 Test purpose

The purpose of this test is to verify that the FD-FDD CE UE configured in CEMode A properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in clause 7.19.

7.3.51.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.51.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 is defined in Section 3.6.

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.51.3-1 will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.51.3-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max (10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.51.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.51.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.51.

7.3.51.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.51.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the RRC parameter *mPDCCH-NumRepetition* is set 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

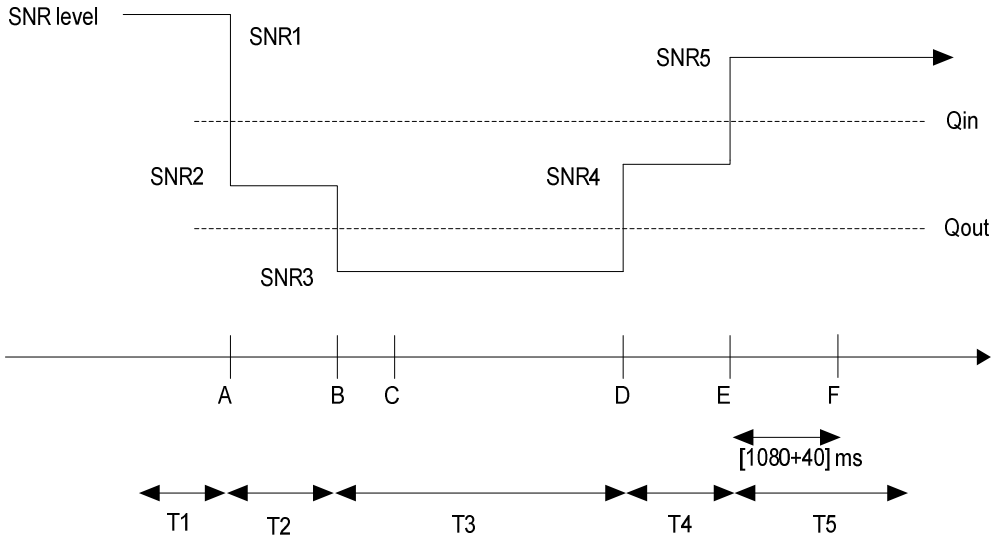

Figure 7.3.51.4-1: SNR variation for in-sync testing in DRX

7.3.51.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.51.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.51.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.51.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in,\ Cat\ M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	8	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH		0	

	to RS EPRE			
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	24	
	MPDCCH repetition level		8	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table 7.3.51.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.51.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.51.5-1. The SS shall select randomly one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.51.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.51.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.51.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.51.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm for carrier frequency less than 3GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1[10] clause 6.3.2.5) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.51.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.51.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.51.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.51.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.51.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.51.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.51.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.51.5 Test requirement

Table 7.3.51.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for CE UE in CEModeA

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters defined in A. 7.1		R.17 FDD Note 7				
OCNG Pattern defined in D.1		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-3.98	-9.4	-18.6	-11.18	-3.98
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.51.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.51.4.1-1are used for this test.

Table 7.3.51.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for CE UE in CEModeA

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.51.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync testing for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	30	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm for carrier frequency less than 3 GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

7.3.52.1 Test purpose

The purpose of this test is to verify that the HD-FDD CE UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.19.

7.3.52.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.52.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.52.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.52.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 20 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the *RRC parameter mPDCCH-NumRepetition* is set to 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

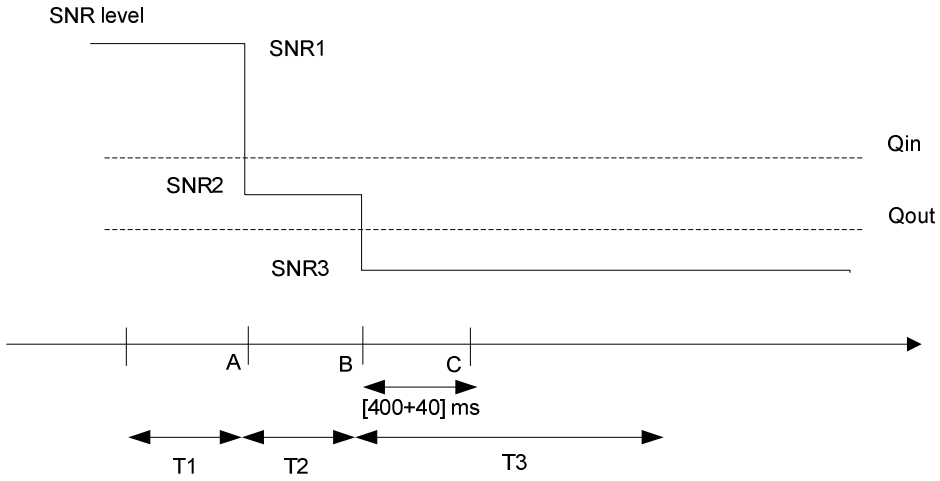

Figure 7.3.52.4-1: SNR variation for out-of-sync testing

7.3.52.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.52.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.52.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.52.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Qout and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4].
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repletion level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	20	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH transmission parameters corresponding to the in-sync and out of sync transmission need not be included in the Reference Measurement Channel.				

7.3.52.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 7.3.52.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.42.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.52.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires; the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.52.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CE ModeA activated according to TS 36.508 [7] clause 7.2A.3AA.

8. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.52.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.52.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	17	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.52.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: Clause H.7.1, Table 7.1-1 EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
config-r11{			
Setup SEQUENCE{			
setConfigToAddModList-r11{			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	sf4		
mpdcch-NumRepetition-r13	r8		
}			
}			
}			
}			
}			

Table 7.3.52.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.52.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.52.5 Test requirement

Table 7.3.52.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring tests for CE UE in CEModeA

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters as defined in A. 7.2		R.7 HD-FDD		
OCNG Pattern defined in D.1		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	1.0	-5.9	-16.7
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.52.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for CE UE in CEModeA

7.3.53.1 Test purpose

The purpose of this test is to verify that the HD-FDD CE UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.19.

7.3.53.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.53.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 is defined in Section 3.6 of TS 36.133 [4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.53.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.53.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 20 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the *RRC parameter mPDCCH-NumRepetition* is set to 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

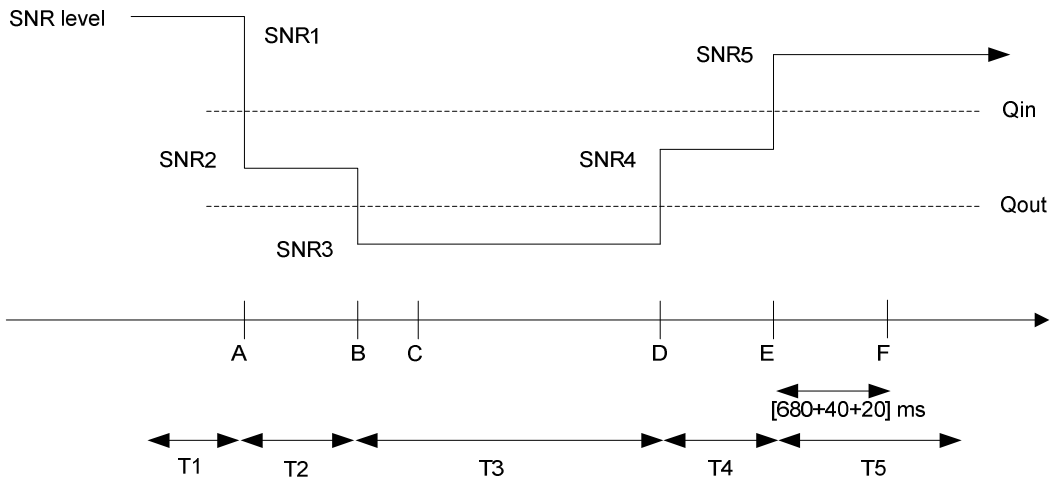

Figure 7.3.53.4-1: SNR variation for in-sync testing

7.3.53.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.53.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.53.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.53.4.1-1: General test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring tests for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]
	M-PDCCH aggregation level	eCCE	4	
	M-PDCCH repletion level		2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repletion level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	20	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.53.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 7.3.53.5-1. Propagation conditions are set according to Annex B.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.53.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.53.5-1. T3 starts.

5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.53.5-1. T4 starts.

6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.53.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (740 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8 After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.53.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.53.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.53.4.3-2: *CQI-ReportConfig-DEFAULT:* E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	17	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.53.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: Clause H.7.1, Table H.7.1-1 EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
config-r11{			
Setup SEQUENCE{			
setConfigToAddModList-r11{			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	sf4		
mpdcch-NumRepetition-r13	r8		
}			
}			
}			
}			
}			

Table 7.3.53.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.53.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.53.5 Test requirement

Table 7.3.53.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring tests for CE UE in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters as defined in A. 7.2		R.7 HD-FDD				
OCNG Pattern defined in D.1		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	6.3	-2.9	-13.7	-2.5	6.3
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.53.4.1-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (740 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.54 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEmodeA

7.3.54.1 Test purpose

The purpose of this test is to verify that the HD-FDD CE UE configured in CEModeA properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in TS 36.133 [4] Section 7.19.

7.3.54.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.54.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The requirements defined in this subclause for performing radio link monitoring are applicable for UE category M1 defined in Section 3.1.

When DRX is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.54.3-1 will be used.

When eDRX_CONN cycle is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.54.3-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max (10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max (10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.54.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for HD-FDD UE category M1 with CE mode A

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.3.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0. 16	Note (20)
0. 16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

Table 7.3.54.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for HD-FDD UE category M1 with CE mode A

eDRX_CONN cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use	

The normative reference for this requirement can be found in TS 36.133 [4] clause 7.19.3 and A.7.3.54.

7.3.54.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.54.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the RRC parameter *mPDCCH-NumRepetition* is set 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

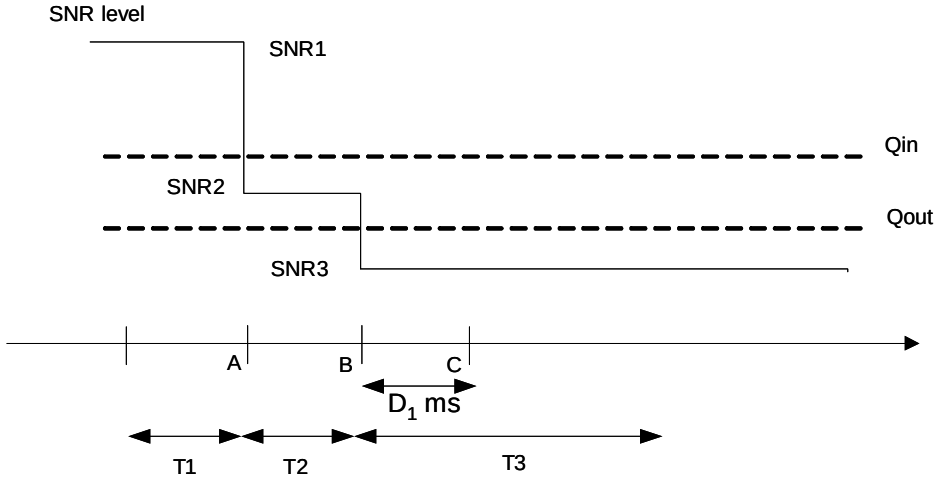

Figure 7.3.54.4-1: SNR variation for out-of-sync testing in DRX

7.3.54.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.54.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.54.4.3
5. There is one cell and one E-UTRA HD-FDD carrier specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.54.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync tests in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212 [31]
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out,\ Cat\ M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in TS 36.133 [4] clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	16	
	MPDCCH repletion level		4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	0	
DRX cycle		Ms	1280	See Table 7.3.54.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		Ms	0	T310 is disabled
T311 timer		Ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		Ms	20	
T1		S	32	
T2		s	12.8	
T3		s	13	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.54.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.54.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.54.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.54.5-1. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm for carrier frequency less than 3GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1[10] clause 6.3.2.5) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm for carrier frequency less than 3GHz) or higher than -48.2 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1[10] clause 6.3.3.5) from time point C (6520 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.54.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.54.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.54.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	**Table H.7.1-1**

Table 7.3.54.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	25	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.54.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf20		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.54.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.54.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.54.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.54.5 Test requirement

Table 7.3.54.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring test in DRX for CE UE in CEModeA

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters defined in A. 7.2		R.7 HD-FDD Note 7		
OCNG Pattern defined in D.1		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	0.97	-6.38	-15.58
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.54.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.54.4.1-1 are used for this test.

Table 7.3.54.5-2: DRX-Configuration for E-UTRAN HD-FDD out-of-sync tests for CE UE in CEModeA

Field	Value	Comment
onDurationTimer	psf20	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.54.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	30	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6520 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm for f<3GHz or -38.7 dBm for 3.0GHz < f ≤ 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal,
- UE output power equal to or less than Transmit OFF power -48.5 dBm for f<3GHz or -48.2dBm for 3.0GHz < f ≤ 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.55 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

7.3.55.1 Test purpose

The purpose of this test is to verify that the HD-FDD CE UE configured in CEMode A properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in TS 36.133 [4] Section 7.19.

7.3.55.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.55.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Qout\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Qin\_DRX\_CatM1}$) specified in Table 7.3.55.3-1 (TS 36.133 [4] Table 7.19.3.2-1) will be used.

When eDRX_CONN cycle is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Qout\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Qin\_DRX\_CatM1}$) specified in Table 7.3.55.3-2 (TS 36.133 [4] Table 7.19.3.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Qout\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Qout\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Qin\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Qin\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.55.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for HD-FDD UE category M1 with CE mode A

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX\_CatM1}$ and $T_{Evaluate\_Qin\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.3.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0.16	Note (20)
0.16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.55.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for HD-FDD UE category M1 with CE mode A

eDRX_CONN cycle length (s)	$T_{Evaluate\_Qout\_DRX\_CatM1}$ and $T_{Evaluate\_Qin\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.3 and A.7.3.55.

7.3.55.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.55.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the RRC parameter *mPDCCH-NumRepetition* is set 8.

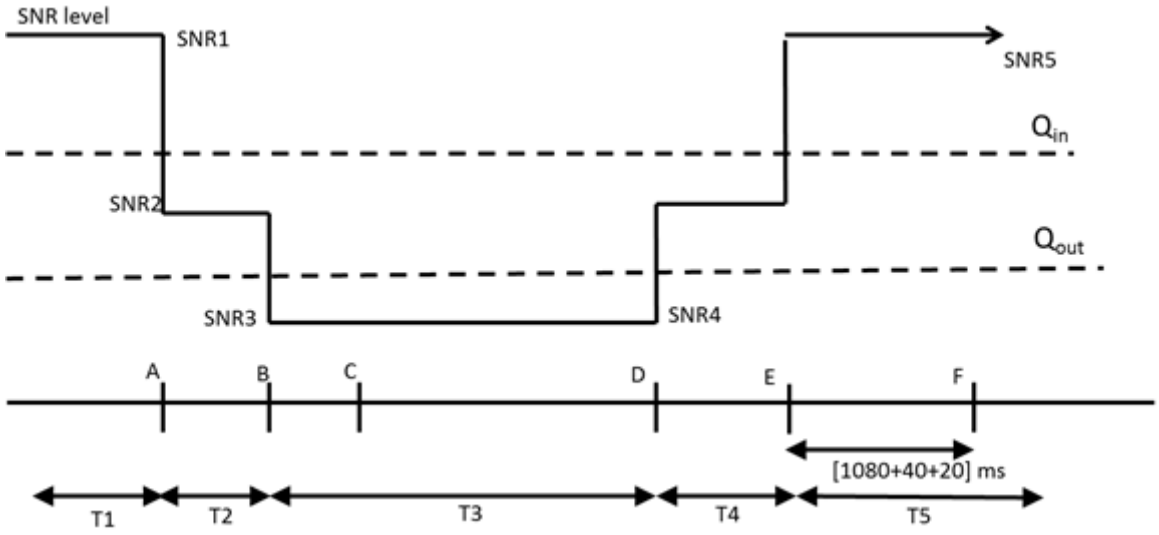

Figure 7.3.55.4-1: SNR variation for in-sync testing in DRX

7.3.55.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.55.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.55.4.3.
5. There is one cell and one E-UTRA HD-FDD carrier specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.55.4.1-1: General test parameters for E-UTRAN HD-FDD in-sync test in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	8	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	24	
	MPDCCH repetition level		8	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table 7.3.55.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213
CQI reporting periodicity		ms	20	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.55.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 20 ms.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.55.5-1. The SS shall select randomly one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.55.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.55.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.55.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.55.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than -39 dBm for carrier frequency less than 3GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1[10] clause 6.3.2.5) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1140 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.55.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.55.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	25	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.55.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf20		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.55.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.55.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.55.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.55.5 Test requirement

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1140 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm for carrier frequency less than 3 GHz or -38.7 dBm for carrier frequency higher than 3GHz, but less than 4.2GHz (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

Table 7.3.55.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for CE UE in CEModeA

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters defined in A. 7.2		R.7 HD-FDD Note 7				
OCNG Pattern defined in D.1		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-3.98	-9.4	-18.6	-11.18	-3.98
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.55.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.55.4.1-1 are used for this test.

Table 7.3.55.5-2: DRX-Configuration for E-UTRAN HD-FDD in-sync tests for CE UE in CEModeA

Field	Value	Comment
onDurationTimer	psf20	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.55.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	30	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213 [5].

7.3.56 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

7.3.56.1 Test purpose

The purpose of this test is to verify that the TDD CE UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN TDD radio link monitoring requirements for UE defined in TS 36.133[4] clause 7.19.

7.3.56.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.56.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.56.

7.3.56.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.56.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

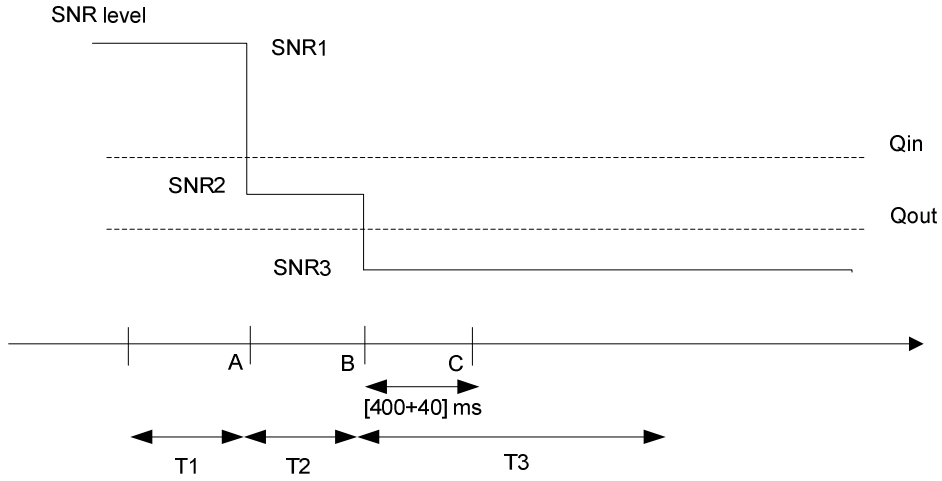

Figure 7.3.56.4-1: SNR variation for out-of-sync testing

7.3.56.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.56.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.56.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.56.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repetition level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.56.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.56.4.1-1
3. Set the parameters according to T1 in Table 7.3.56.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.56.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.56.5-1. T3 starts.
6. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires, the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.56.5-1.

8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CE ModeA activated according to TS 36.508 [7] clause 7.2A.3AA.

9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.56.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.56.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 , Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.56.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	24	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.56.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
tdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

Table 7.3.56.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.56.5 Test requirement

Table 7.3.56.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests for CE UE in CEModeA

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
MPDCCH parameters as defined in A.7.3		R.15 TDD Note 8		
OCNG Pattern defined in D.2		OP.11 TDD		
ρ_A, ρ_B		-3		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 7	dB	0.6	-6.2	-17.0
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.56.4-1.
Note 8: Aggregation level and repetition levels specified in 7.3.56.4-1 are used for this test.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.57 E-UTRAN TDD Radio Link Monitoring Test for In-Sync for CE UE in CEModeA

7.3.57.1 Test purpose

The purpose of this test is to verify that the TDD CE UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN TDD radio link monitoring requirements for UE defined in TS 36.133[4] clause 7.19.

7.3.57.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

7.3.57.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.57.

7.3.57.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.57.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 1 ms.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

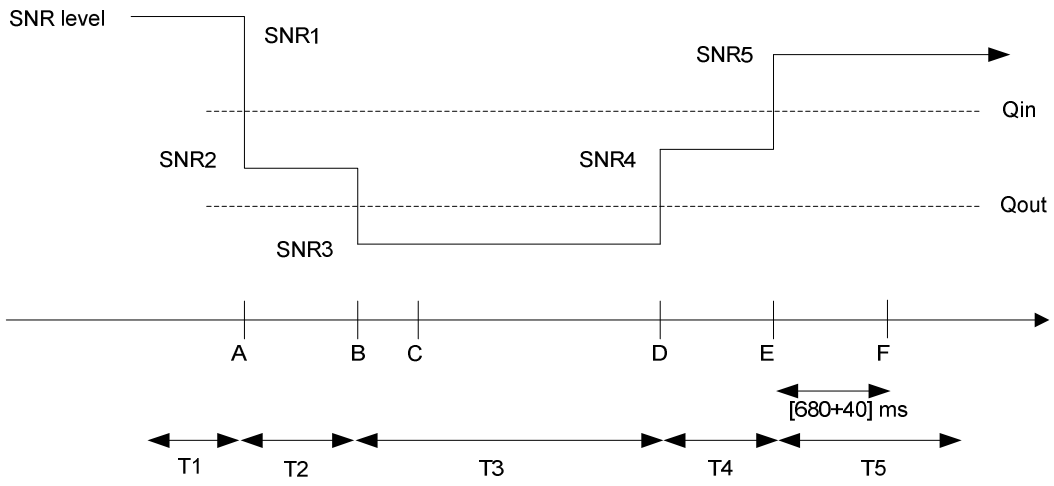

Figure 7.3.57.4-1: SNR variation for in-sync testing

7.3.57.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.57.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.57.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.57.4.1-1: General test parameters for E-UTRAN TDD in-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	4	
	M-PDCCH repetition level		2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repetition level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.57.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.57.4.1-1
3. Set the parameters according to T1 in Table 7.3.57.5-1. Propagation conditions are set according to Annex B.2. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.57.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.57.5-1. T3 starts.
6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.57.5-1. T4 starts.
7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.57.5-1. T5 starts.
8. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (620 ms after the start of time duration T5) the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.57.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.57.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	24	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.57.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
numberPRB-Pairs-v1310 CHOICE {			
setup	n4		
}			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r4		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

Table 7.3.57.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.57.5 Test requirement

Table 7.3.57.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring tests for CE UE in CEModeA

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
MPDCCH parameters as defined in A.7.3.		R.15 TDD				
OCNG Pattern defined in D.2		OP.11 TDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 2	dB					
OCNG_RB Note 2	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	6.0	-2.9	-13.7	-2.8	6.0
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.57.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (720 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.58 E- UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

7.3.58.1 Test purpose

The purpose of this test is to verify that the TDD CE UE configured in CEMode A properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133[4] clause 7.19.

7.3.58.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.58.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 of TS 36.133[4] is defined in Section 3.6 of TS 36.133[4].

When DRX is used for FD-FDD and TDD category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.58.3-1 (TS 36.133 [4] Table 7.19.2.2-1) will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.58.3-2 (TS 36.133 [4] Table 7.19.2.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.58.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use	

Table 7.3.58.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.58.

The test parameters are given in Tables 7.3.58.4.1-1, 7.3.58.5-1, 7.3.58.5-2 and 7.3.58.5-3.

7.3.58.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.58.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the RRC parameter *mPDCCH-NumRepetition* is set 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

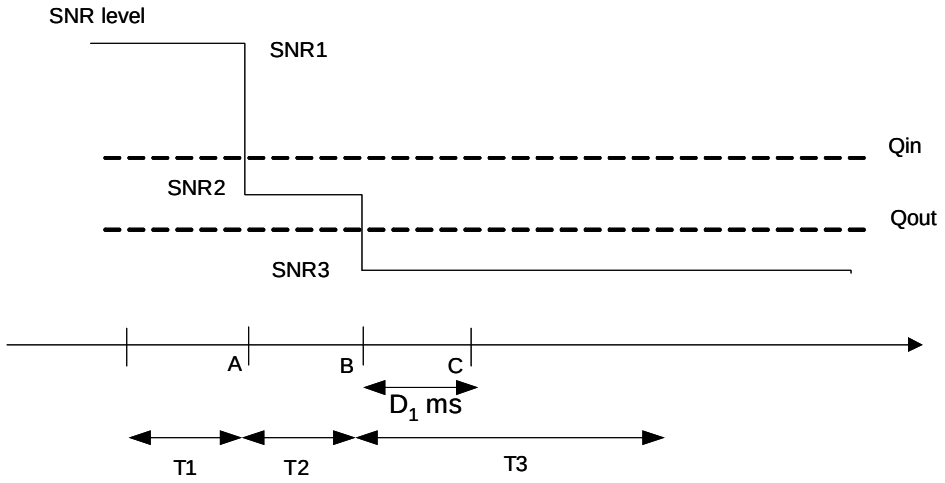

Figure 7.3.58.4-1: SNR variation for out-of-sync testing in DRX

7.3.58.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.58.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.58.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.58.4.1-1: General test parameters for E-UTRAN TDD out-of-sync tests in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out,\ Cat\ M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	16	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	1280	See Table A.7.3.58.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.58.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to

send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.58.4.1-1.
3. Set the parameters according to T1 in Table 7.3.58.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.58.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.58.5-1. T3 starts.
6. If the SS a) detects uplink power equal to or higher than [-39] dBm (as defined in TS 36.521-1[10] clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B, and b) does not detect any uplink power higher than [-48.5] dBm (as defined in TS 36.521-1[10] clause 6.3.3.5 for carrier frequency less than [3]GHz) from time point C (6500 ms (D1) after the start of T3) until T3 expires, then the number of successful tests is increased by one. Otherwise the number of failed tests is increased by one.
7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.58.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
9. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.58.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.58.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.58.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		

}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.58.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.58.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.58.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX in CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.58.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.58.5 Test requirement

Table 7.3.58.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for CE UE in CEModeA

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration		6		
Uplink-downlink configuration		1		
MPDCCH parameters defined in A.7.3		R.15 TDD		
OCNG Pattern defined in D.2		OP.11 TDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	1.15	-6.28	15.48
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.58.1-1.

Table 7.3.58.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync tests for UE in CEModeA

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.58.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync testing for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	27	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.59 E- UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

7.3.59.1 Test purpose

The purpose of this test is to verify that the TDD CE UE configured in CEMode A properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133[4] clause 7.19.

7.3.59.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

7.3.59.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 of TS 36.133[4] is defined in Section 3.6 of TS 36.133[4].

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.59.3-1 will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Q_{out\_DRX\_CatM1}}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Q_{in\_DRX\_CatM1}}$) specified in Table 7.3.59.3-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.3.59.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use	

Table 7.3.59.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_CatM1}}$ and $T_{Evaluate\_Q_{in\_DRX\_CatM1}}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.59.

The test parameters are given in Tables 7.3.59.4.1-1, 7.3.59.5-1, 7.3.59.5-2 and 7.3.59.5-3.

7.3.59.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.59.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the RRC parameter *mPDCCH-NumRepetition* is set 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

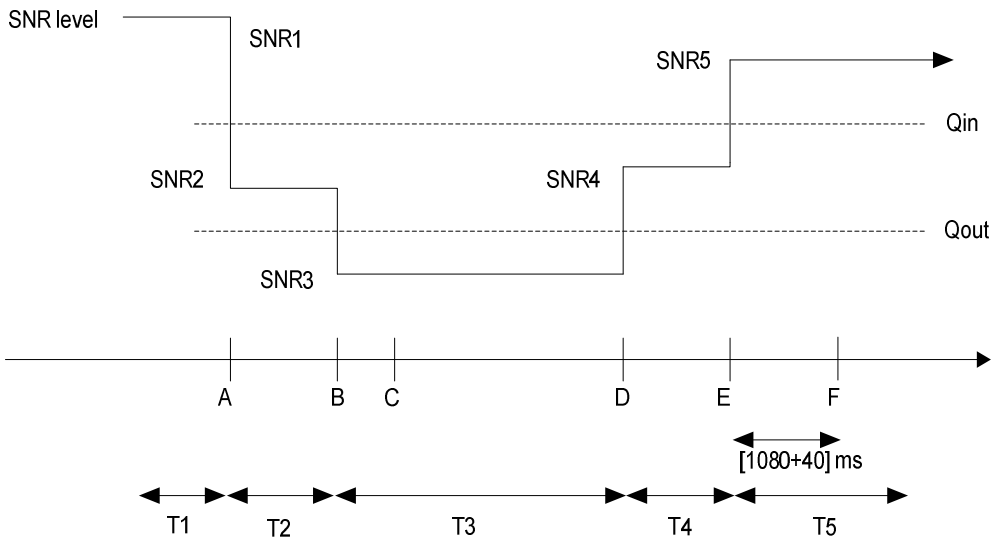

Figure 7.3.59.4-1: SNR variation for in-sync testing in DRX

7.3.59.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.59.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.59.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.59.4.1-1: General test parameters for E-UTRAN TDD In-sync tests in DRX for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	8	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	24	
	MPDCCH repetition level		8	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table A.7.3.59.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.59.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.59.4.1-1

3. Set the parameters according to T1 in Table 7.3.59.5-1. Propagation conditions are set according to Annex B.1. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.59.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.59.5-1. T3 starts.
6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.59.5-1. T4 starts.
7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.59.5-1. T5 starts.
8. If the SS detects uplink power equal to or higher than [-39 dBm] (as defined in TS 36.521-1 clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
9. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.59.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.59.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.7.1-1

Table 7.3.59.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.59.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.59.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.59.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.59.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.59.5 Test requirement

Table 7.3.59.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring tests in DRX for CE UE in CEModeA

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration		6				
Uplink-downlink configuration		1				
MPDCCH parameters defined in A.7.3		R.15 TDD				
OCNG Pattern defined in D.2		OP.11 TDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-3.9	-9.33	-18.53	-12.1	-3.9
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.59.4.1-1.

Table 7.3.59.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync tests for UE in CEModeA

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.59.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync testing for CE UE in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	27	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

7.3.60.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.60.2 Test applicability

This test applies to all types of NB-IoT HD FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for FGI bit 5.

7.3.60.3 Minimum conformance requirements

The requirements defined in this subclause for performing radio link monitoring are applicable for Category NB1 UE defined in Section 3.1 of TS36.133.

The UE shall meet all applicable requirements specified in this clause under the following condition:

- at least 1 DL subframe per radio frame of serving NB-IoT cell is available at the UE during $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ evaluation periods.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ for the purpose of monitoring downlink radio link quality of the NB-IoT cell.

The threshold $Q_{out\_NB\text{-}IoT}$ is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.60.3-1.

The threshold $Q_{in\_NB\text{-}IoT}$ is defined as the level at which the downlink radio link quality can be significantly more reliably received than at $Q_{out\_NB\text{-}IoT}$ and shall correspond to 2% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.60.3-1.

Table 7.3.60.3-1: NPDCCH transmission parameters for out-of-sync and in-sync for Category NB1 UE

Attribute	Out-of-sync	In-sync
DCI format	Format N1	Format N1
Number of information bits	22 bits	22 bits
System Bandwidth	200kHz	200kHz
Antenna configuration	2x1	2x1
Maximum NPDCCH Repetition level	R_{max} Note1	$R_{max}/4$ Note1
Aggregation level	2	2
DRX	OFF	OFF
Deployment mode	In-band	In-band
NOTE 1: R_{max} is a configurable parameter defined in TS 36.331[5].		

When DRX is used for HD-FDD Category NB1 UE UEs, the $Q_{out\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$) and the $Q_{in\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$) is specified in Table 7.3.60.3-2 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in TS36.213[8], clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least max([10]ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.60.3-2: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ (s)	
	DRX cycles for R_{max}<=64	DRX cycles for R_{max}>64
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.60.

7.3.60.4 Test description

The test consists of one subtest with one NB-IOT cell (Ncell 1) and one EUTRAN cell (cell 1) configured. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.60.4-1 shows the different

time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync state with the following testing procedure:

- Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell1
- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

  NOTE 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant. The UE shall not be provisioned with any more UL grants until the start of time period T4.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

  NOTE 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

  NOTE 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode the NPDCCH and complete the UL transmission when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

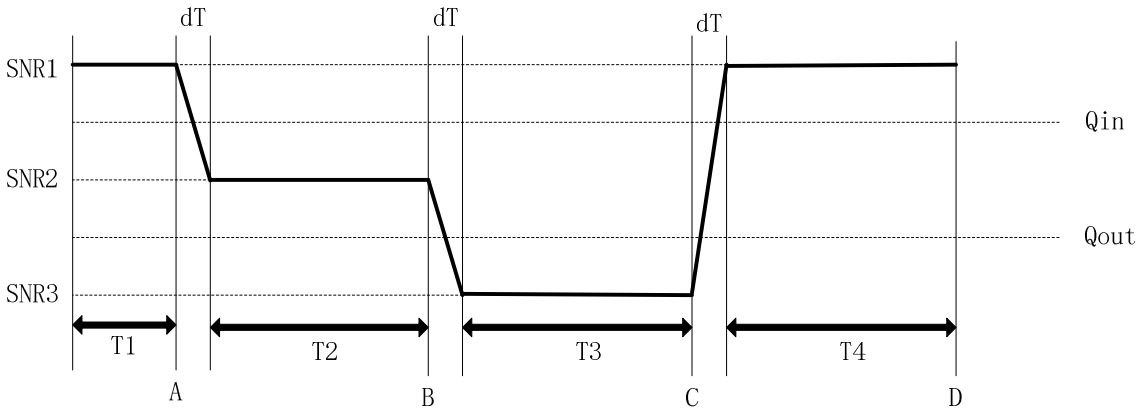

Figure 7.3.60.4-1: SNR variation for out-of-sync testing in DRX for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under normal coverage

7.3.60.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.60.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.60.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.60.4.3

5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.60.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Value	Comment
Active cell		nCell 1	
EUTRAN cell		eCell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		8	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.60.3-1
DRX cycle	ms	256	See Table 7.3.60.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	1000	T311 is enabled
T1	s	5.12	
dT	s	0.8	
T2	s	10.24	
dT	s	0.7	
T3	s	5.12	
dT	s	1.4	
T4	s	5.12	

Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.
Note 2: N310, N311, T310 and T311 are defined in TS 36.331[5].
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

7.3.60.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.60.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.60.5-1.
4. When dT expires the SS shall change the SNR value to T2 (SNR2) as specified in Table 7.3.60.5-1. T2 starts.
5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1. No more UL grants are given until start of T4.
6. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.60.5-1.
7. When dT expires the SS shall change the SNR value to T3 (SNR3) as specified in Table 7.3.60.5-1. T3 starts.
8. During T3 the UE is expected to detect OOS and declare RLM.
9. When T3 expires, the 3rd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.60.5-1.
10. When dT expires the SS shall keep the SNR value corresponding to T4 as specified in Table 7.3.60.5-1. T4 starts.
11. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -48.2 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T4 the number of failed tests is increased by one.

    Otherwise the number of successful tests is increased by one.
12. After T4 expires the UE is switched off and then on. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.60.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.3.60.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in normal coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-1
Default RRC messages and information elements contents exceptions	

Table 7.3.60.4.3-2: *RRCConnectionSetup-NB*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in normal coverage

Derivation Path: TS 36.508 [7] clause8.1.6.1, Table 8.1.6.1-14: RRCConnectionSetup-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetup-NB ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetup-r13 SEQUENCE {			
radioResourceConfigDedicated-r13{			
srb-ToAddModList-r13 SEQUENCE (SIZE (1)) OF SEQUENCE {}			
mac-MainConfig CHOICE {	MAC-MainConfig-NB-SRB		
}			
}			
}			
}			
}			

Table 7.3.60.4.3-3: *MAC-MainConfig-NB*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in normal coverage

Derivation Path: TS 36.508 clause 8.1.8, Table 8.1.8.2.1.5-1: MAC-MainConfig-NB-SRB			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-NB-SRB ::= SEQUENCE {			
drx-Config-r13 CHOICE {			
setup SEQUENCE {			
onDurationTimer-r13	pp1		
drx-InactivityTimer-r13	pp0		
drx-RetransmissionTimer-r13	pp0		
drx-Cycle-r13	sf256		
drx-StartOffset-r13	0		
drx-ULRetransmissionTimer-r13	pp0		
}			
}			
}			

7.3.60.5 Test requirement

Table 7.3.60.5-1: NCell specific test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4
$BW_{channel}$	kHz	180						
PRB location within eCell		eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30						
NPDCCH parameters as defined in A.10.1		R.29 HD-FDD						
NPBCH_RA	dB	-3						
NPBCH_RB	dB							
NPSS_RA	dB							
NSSS_RA	dB							
NPDCCH_RA	dB							
NPDCCH_RB	dB							
NPDSCH_RA	dB							
NPDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc} Note 3	dBm/15 kHz	Specified in Table 7.3.60.5-1a						
SNR Note 4, 5	dB	-2.5	Note 6	-8.5	Note 7	-14.7	Note 8	-2.5
Propagation condition		AWGN						
Antenna Configuration		2x1						

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2, T3 and T4 are denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure 7.3.60.4-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.60.5-1a: Cell 1 specific test parameters for HD-FDD Out-of-sync radio link monitoring test with DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	eCell 1
		T1-T4
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.60.5-2: DRX-Configuration for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.60.5-3: *TimeAlignmentTimer* -Configuration for NB-IoT HD-FDD out-of-sync testing for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

7.3.61.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.61.2 Test applicability

This test applies to all types of NB-IoT HD FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for FGI bit 5.

7.3.61.3 Minimum conformance requirements

The requirements defined in this subclause for performing radio link monitoring are applicable for Category NB1 UE defined in Section 3.1 of TS36.133.

The UE shall meet all applicable requirements specified in this clause under the following condition:

- at least 1 DL subframe per radio frame of serving NB-IoT cell is available at the UE during $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ evaluation periods.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ for the purpose of monitoring downlink radio link quality of the NB-IoT cell.

The threshold $Q_{out\_NB\text{-}IoT}$ is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.61.3-1.

The threshold $Q_{in\_NB\text{-}IoT}$ is defined as the level at which the downlink radio link quality can be significantly more reliably received than at $Q_{out\_NB\text{-}IoT}$ and shall correspond to 2% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.61.3-1.

Table 7.3.61.3-1: NPDCCH transmission parameters for out-of-sync and in-sync for Category NB1 UE

Attribute	Out-of-sync	In-sync
DCI format	Format N1	Format N1
Number of information bits	22 bits	22 bits
System Bandwidth	200kHz	200kHz
Antenna configuration	2x1	2x1
Maximum NPDCCH Repetition level	R_{max} Note1	$R_{max}/4$ Note1
Aggregation level	2	2
DRX	OFF	OFF
Deployment mode	In-band	In-band
NOTE 1: R_{max} is a configurable parameter defined in TS 36.331[5].		

When DRX is used for HD-FDD Category NB1 UE UEs, the $Q_{out\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$) and the $Q_{in\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$) is specified in Table 7.3.61.3-2 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in TS36.213[8], clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least max([10]ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.61.3-2: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Q_{out}\_DRX\_NB\text{-}IoT}$ and $T_{Evaluate\_Q_{in}\_DRX\_NB\text{-}IoT}$ (s)	
	DRX cycles for R_{max}<=64	DRX cycles for R_{max}>64
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.61.

7.3.61.4 Test description

The test consists of one subtest with one NB-IOT cell (Ncell 1) and one EUTRAN cell (cell 1) configured. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.61.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync state with the following testing procedure:

- Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell1
- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

  NOTE 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant. The UE shall not be provisioned with any more UL grants until the start of time period T4.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

  NOTE 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

  NOTE 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode the NPDCCH and complete the UL transmission when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

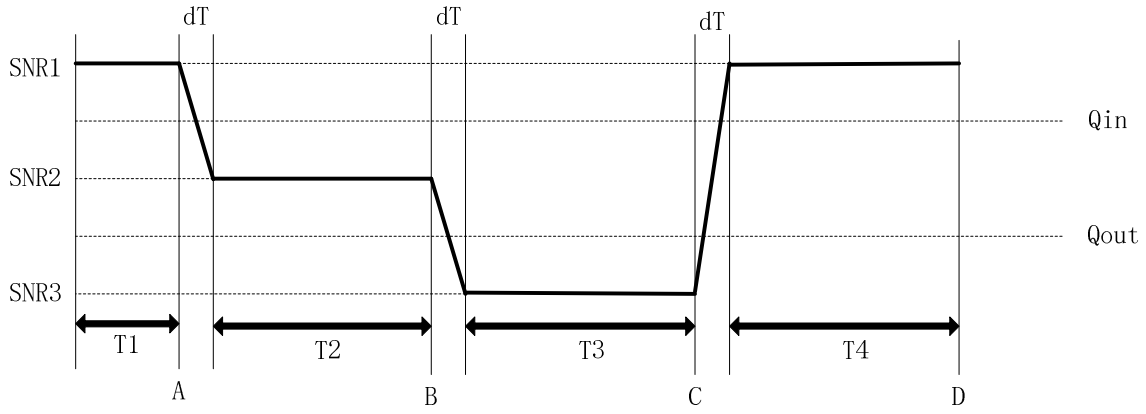

Figure 7.3.61.4-1: SNR variation for out-of-sync testing in DRX for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under enhanced coverage

7.3.61.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.61.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.61.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.61.4.3
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.61.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	Value	Comment
Active cell		nCell 1	
EUTRAN cell		eCell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		16	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.61.3-1
DRX cycle	ms	256	See Table 7.3.61.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	1000	T311 is enabled
T1	s	5.12	
dT	s	0.7	
T2	s	10.24	
dT	s	0.8	
T3	s	5.12	
dT	s	1.4	
T4	s	5.12	

Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.
Note 2: N310, N311, T310 and T311 are defined in TS 36.331[5].
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

7.3.61.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.61.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.61.5-1.
4. When dT expires the SS shall change the SNR value to T2 (SNR2) as specified in Table 7.3.61.5-1. T2 starts.
5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1. No more UL grants are given until start of T4.
6. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.61.5-1.
7. When dT expires the SS shall change the SNR value to T3 (SNR3) as specified in Table 7.3.61.5-1. T3 starts.
8. During T3 the UE is expected to detect OOS and declare RLM.
9. When T3 expires, the 3rd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.61.5-1.
10. When dT expires the SS shall keep the SNR value corresponding to T4 as specified in Table 7.3.60.5-1. T4 starts.
11. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -48.2 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T4 the number of failed tests is increased by one.

    Otherwise the number of successful tests is increased by one.
12. After T4 expires the UE is switched off and then on. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.61.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.3.61.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in enhanced coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-1
Default RRC messages and information elements contents exceptions	

Table 7.3.61.4.3-2: *RRCConnectionSetup-NB*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in enhanced coverage

Derivation Path: TS 36.508 [7] clause8.1.6.1, Table 8.1.6.1-14: RRCConnectionSetup-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetup-NB ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetup-r13 SEQUENCE {			
radioResourceConfigDedicated-r13{			
srb-ToAddModList-r13 SEQUENCE (SIZE (1)) OF SEQUENCE {}			
mac-MainConfig CHOICE {	MAC-MainConfig-NB-SRB		
}			
}			
}			
}			
}			

Table 7.3.61.4.3-3: *MAC-MainConfig-NB*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync with DRX for UE Category NB1 In-Band mode in enhanced coverage

Derivation Path: TS 36.508 clause 8.1.8, Table 8.1.8.2.1.5-1: MAC-MainConfig-NB-SRB			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-NB-SRB ::= SEQUENCE {			
drx-Config-r13 CHOICE {			
setup SEQUENCE {			
onDurationTimer-r13	pp1		
drx-InactivityTimer-r13	pp0		
drx-RetransmissionTimer-r13	pp0		
drx-Cycle-r13	sf256		
drx-StartOffset-r13	0		
drx-ULRetransmissionTimer-r13	pp0		
}			
}			
}			

7.3.61.5 Test requirement

Table 7.3.61.5-1: NCell specific test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4
$BW_{channel}$	kHz	180						
PRB location within eCell		eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30						
NPDCCH parameters as defined in A.10.1		R.29 HD-FDD						
NPBCH_RA	dB	-3						
NPBCH_RB	dB							
NPSS_RA	dB							
NSSS_RA	dB							
NPDCCH_RA	dB							
NPDCCH_RB	dB							
NPDSCH_RA	dB							
NPDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc}	dBm/15 kHz	Specified in Table 7.3.61.5-1a						
SNR Note 4, 5	dB	-5.7	Note 6	-10.8	Note 7	-18.0	Note 8	-5.7
Propagation condition		AWGN						
Antenna Configuration		2x1						

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2, T3 and T4 are denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure 7.3.61.4-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.61.5-1a: eCell 1 specific test parameters for HD-FDD Out-of-sync radio link monitoring test with DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	eCell 1
		T1-T4
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.61.5-2: DRX-Configuration for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.61.5-3: *TimeAlignmentTimer* -Configuration for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4.

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.62 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Enhanced Coverage

7.3.62.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE configured in enhanced coverage properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell when DRX is used. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 clause 7.23.

7.3.62.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for FGI bit 5.

7.3.62.3 Minimum conformance requirements

When DRX is used for HD-FDD Category NB1 UEs, the $Q_{out\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$) and the $Q_{in\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$) is specified in Table 7.3.62.3-1 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.62.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ (s)	
	DRX cycles for $R_{max} \leq 64$	DRX cycles for $R_{max} > 64$
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23.2 and A.7.3.62.

7.3.62.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell, and an E-UTRA cell (Cell 1), in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.62.4-1 shows the variation of the

downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in designated uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2 and T3 are as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR1.
- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. During the period from time point A to time point D, the UE shall not be provisioned with any UL grant.
- Thereafter UE switches back to downlink.

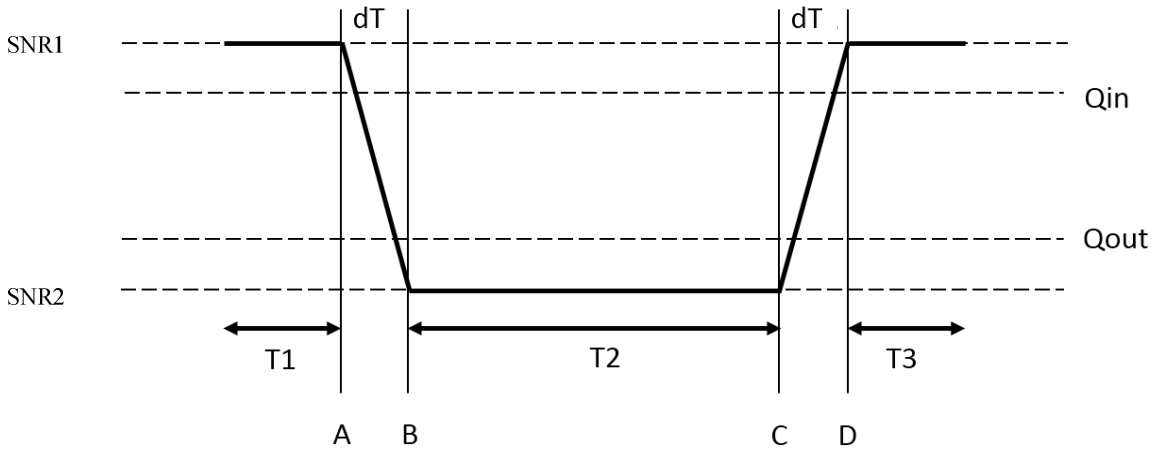

Figure 7.3.62.4-1: SNR variation for in-sync testing with DRX

7.3.62.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.62.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.62.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.62.4.3.
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is an E-UTRA cell.

Table 7.3.62.4.1-1: General test parameters for HD-FDD in-sync test with DRX for UE category NB1 In-Band mode in enhanced coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			nCell1 1	NB-IOT cell nCell1 is within E-UTRA cell Cell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		4	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		16	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
DRX cycle		ms	256	See Table 7.3.62.5-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	4000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	4	
dT		s	1.4	
T2		s	1.84	
dT		s	1.4	
T3		s	4	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.62.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.62.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the 1st time window dT starts, During dT the SS shall change the SNR as specified in Table 7.3.62.5-1.
4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.62.5-1. T2 starts.
5. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR as specified in Table 7.3.62.5-1.

6. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.62.5-1. T3 starts.

7. During T3 the SS shall send the UE continuous grants to transmit on the uplink. The UE is expected to decode the uplink grant, switch to uplink and complete the corresponding uplink transmission. If the SS detects uplink transmissions from the UE according to the subframes scheduled for NPUSCH transmission by the uplink grant, during the period from time point D until T3 expires, the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.62.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition “Inband_Different” with the following exceptions:

Table 7.3.62.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Enhanced coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-2
Default RRC messages and information elements contents exceptions	

7.3.62.5 Test requirement

Table 7.3.62.5-1: Ncell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 In-Band mode in enhanced coverage

Parameter	Unit	nCell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	180				
PRB location within E-UTRA Cell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30				
NPDCCH parameters defined in Annex A.10.1		R.27 HD-FDD				
Ratio of NPDSCH to NRS EPRE		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.62.5-2				
SNR Note 5, Note 6	dB	-5.7	Note 7	-17.4	Note 8	-6.3
Propagation condition		AWGN				
Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in E-UTRA Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.62.4.1-1.
Note 7: The Test system shall reduce it's transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 8: The Test system shall increase it's transmit power in steps of ((SNR1-SNR2) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.62.5-2: Cell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 In-Band mode in enhanced coverage

		eCell 1
		T1-T3
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1
Note 1: OCNG shall be used such that the E-UTRA Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

Table 7.3.62.5-3: DRX-Configuration for E-UTRAN HD-FDD in-sync tests with DRX for UE category NB1 configured In-Band mode in enhanced coverage

Field	Value	Comment
onDurationTimer	p1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 7.3.62.5-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync tests with DRX for UE category NB1 In-Band mode in enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

During the period from time point D until T3 expiration, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.63 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Normal Coverage

7.3.63.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE configured in normal coverage properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell when DRX is used. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 clause 7.23.

7.3.63.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE category NB1 and higher. Applicability requires support for FGI bit 5.

7.3.63.3 Minimum conformance requirements

When DRX is used for HD-FDD Category NB1 UEs, the $Q_{out\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$) and the $Q_{in\_NB\text{-}IoT}$ evaluation period ($T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$) is specified in Table 7.3.63.3-1 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.63.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_DRX\_NB\text{-}IoT}}$ (s)	
	DRX cycles for $R_{max} \leq 64$	DRX cycles for $R_{max} > 64$
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23.2 and A.7.3.63.

7.3.63.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell, and an E-UTRA cell (Cell 1), in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.63.4-1 shows the variation of the

downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in designated uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2 and T3 are as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR1.
- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. During the period from time point A to time point D, the UE shall not be provisioned with any UL grant.

Thereafter UE switches back to downlink.

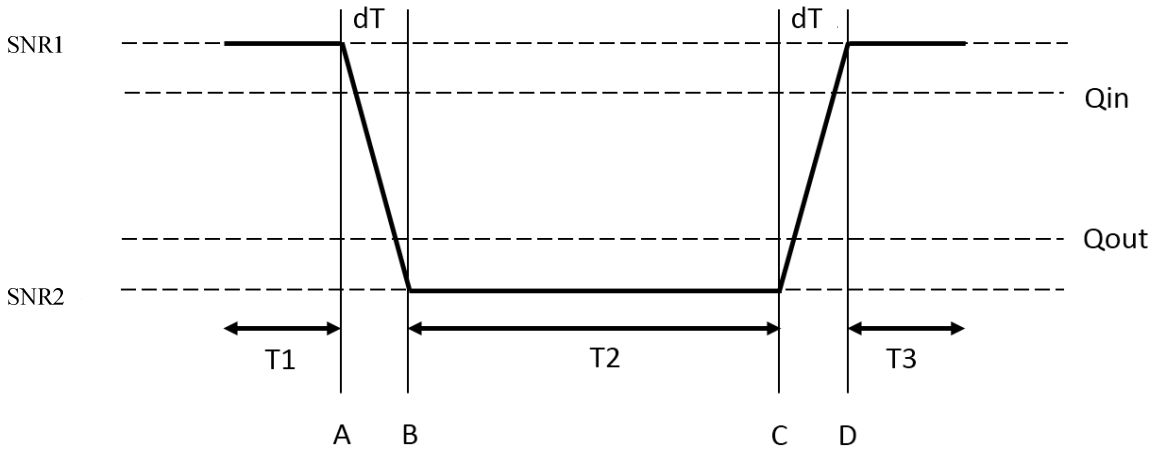

Figure 7.3.63.4-1: SNR variation for in-sync testing with DRX

7.3.63.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.63.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.63.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.63.4.3.
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is an E-UTRA cell.

Table 7.3.63.4.1-1: General test parameters for HD-FDD in-sync test with DRX for UE category NB1 In-Band mode in normal coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			nCell 1	NB-IOT cell nCell1 is within E-UTRA cell Cell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		2	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		8	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
DRX cycle		ms	256	See Table 7.3.63.5-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	4000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	4	
dT		s	1.4	
T2		s	1.84	
dT		s	1.4	
T3		s	4	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.63.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.63.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the 1st time window dT starts, During dT the SS shall change the SNR as specified in Table 7.3.63.5-1.
4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.63.5-1. T2 starts.
5. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR as specified in Table 7.3.63.5-1.

6. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.63.5-1. T3 starts.

7. During T3 the SS shall send the UE continuous grants to transmit on the uplink. The UE is expected to decode the uplink grant, switch to uplink and complete the corresponding uplink transmission. If the SS detects uplink transmissions from the UE according to the subframes scheduled for NPUSCH transmission by the uplink grant, during the period from time point D until T3 expires, the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.63.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.3.63.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Normal Coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-2
Default RRC messages and information elements contents exceptions	

7.3.63.5 Test requirement

Table 7.3.63.5-1: Ncell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 In-Band mode in normal coverage

Parameter	Unit	nCell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	180				
PRB location within E-UTRA Cell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30				
NPDCCH parameters defined in A.10.1		R.27 HD-FDD				
Ratio of NPDSCH to NRS EPRE		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.63.5-2				
SNR Note 5, Note 6	dB	-2.5	Note 7	-14.1	Note 8	-3.1
Propagation condition		AWGN				
Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in Ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.63.4.1-1.
Note 7: The Test system shall reduce it's transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 8: The Test system shall increase it's transmit power in steps of ((SNR1-SNR2) / (10*dT)) dB every 100ms until SNR1 can be ensured at the end of dT.

Table 7.3.63.5-2: Cell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 In-Band mode in normal coverage

		eCell 1
		T1-T3
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	4
Propagation Condition		AWGN
Antenna Configuration		2x1
Note 1: OCNG shall be used such that the E-UTRA Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

Table 7.3.63.5-3: DRX-Configuration for E-UTRAN HD-FDD in-sync tests with DRX for UE category NB1 In-Band mode in normal coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 7.3.63.5-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync tests with DRX for UE category NB1 In-Band mode in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

During the period from time point D until T3 expiration, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.64 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage

7.3.64.1 Test Purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when the UE is under normal coverage conditions. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 [4] section 7.23.

7.3.64.2 Test Applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

7.3.64.3 Minimum Conformance Requirements

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send an out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ $Q_{out\_NB\text{-}IoT}$ evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send an in-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ $Q_{in\_NB\text{-}IoT}$ evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5]. The following table 7.3.64.3-1 defines the $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ for each coverage mode.

Table 7.3.64.3-1: Mapping of coverage mode and Q_{out} and Q_{in} Evaluation Period in non-DRX for HD-FDD Category NB1 UE

Coverage Mode	$T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$	$T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$
Normal	400ms	200ms
Enhanced	4000ms	2000ms

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.64.

7.3.64.4 Test description

There is one cell (nCell 1), which is the active NB-IoT cell, in the test. The test consists of five successive time periods, with time duration of T1, dT, T2, dT and T3 respectively. Figure 7.3.64.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states.

Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell 1. The UE is scheduled in designated uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is disabled, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2, dT and T3 shall be as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR3.

- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. During the period from time point A to time point D, the UE shall not be provisioned with any UL grant.
- Thereafter UE switches back to downlink.

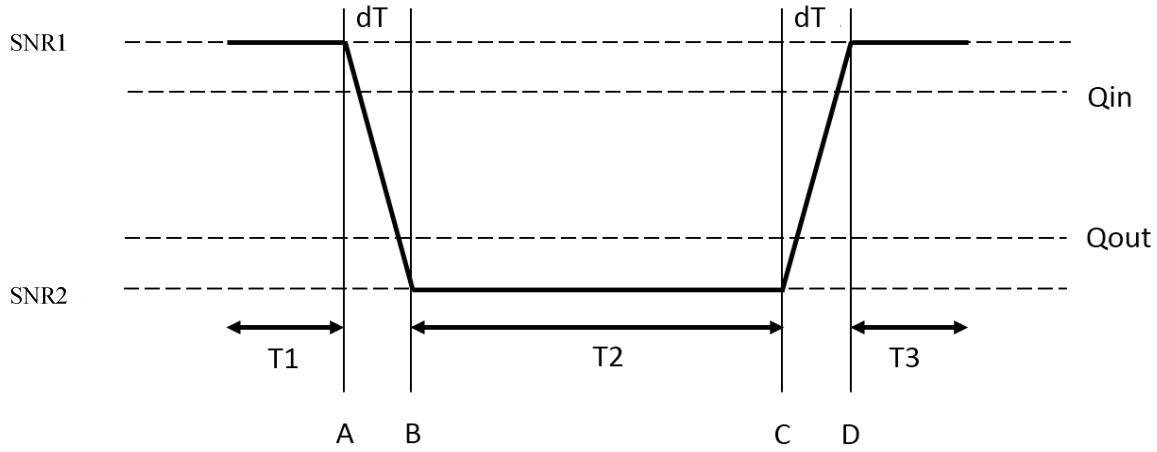

Figure 7.3.64.4-1: SNR variation for in-sync testing without DRX

7.3.64.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E Table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.64.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 without faders using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.64.4.1-1 and 7.3.64.5.1-3.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.64.4.3.
5. There is one NB1 Cell and one EUTRA Cell specified in this test. nCell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.64.4.1-1: General test parameters for HD-FDD in-sync test without DRX for UE category NB1 In-Band mode in normal coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			nCell 1	NB-IOT cell nCell1 is within E-UTRA cell eCell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		2	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		8	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	4000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	4	
dT		s	1.4	
T2		s	1.84	
dT		s	1.4	
T3		s	4	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.64.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell 1. The UE shall be configured for NPUSCH transmission for every possible uplink sub-frame.

1. Ensure the UE is in State 2A-NB with CP CIoT optimisation according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.64.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the 1st time window dT starts, During dT the SS shall change the SNR as specified in Table 7.3.64.5-1.
4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.64.5-1. T2 starts.
5. When T2 expires the 2nd time window dT starts. During dT the SS shall change the SNR as specified in Table 7.3.64.5-1.

6. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.64.5-1. T3 starts.

7. During T3 the SS shall send the UE continuous grants to transmit on the uplink. The UE is expected to decode the uplink grant, switch to uplink and complete the corresponding uplink transmission. If the SS detects uplink transmissions from the UE according to the subframes scheduled for NPUSCH transmission by the uplink grant, during the period from time point D until T3 expires, the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

8. After T3 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.64.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition “Inband_Different” with the following exceptions:

Table 7.3.64.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in normal coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-2
Default RRC messages and information elements contents exceptions	

7.3.64.5 Test requirement

Table 7.3.64.5.1-1: nCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 In-Band mode in normal coverage

Parameter	Unit	nCell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	200				
PRB location within eCell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30				
NPDCCH parameters defined in A.10.1		R.27 HD-FDD				
NPDSCH_RA		-3				
NPDSCH_RB		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.64.5.1-2				
SNR Note 5, Note 6	dB	-2.5	Note 7	-14.1	Note 8	-3.1
Propagation condition		AWGN				
Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.64.4-1.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR2) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT

Table 7.3.64.5.1-2: eCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 In-Band mode in normal coverage

Parameter	Unit	eCell 1
		T1-T3
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	6
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.64.5.1-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync tests without DRX for UE category NB1 In-Band mode in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]

During the period from time point D until T3 expiration, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.65 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage

7.3.65.1 Test Purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when the UE is under normal coverage conditions. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 [4] section 7.23.

7.3.65.2 Test Applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of UE Category NB1 and higher.

7.3.65.3 Minimum Conformance Requirements

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send an out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ $Q_{out\_NB\text{-}IoT}$ evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send an in-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ $Q_{in\_NB\text{-}IoT}$ evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5]. The following table 7.3.65.3-1 defines the $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$ for each coverage mode.

Table 7.3.65.3-1: Mapping of coverage mode and Q_{out} and Q_{in} Evaluation Period in non-DRX for HD-FDD Category NB1 UE

Coverage Mode	$T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$	$T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$
Normal	400ms	200ms
Enhanced	4000ms	2000ms

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.65.

7.3.65.4 Test description

There is one cell (nCell 1), which is the active NB-IoT cell, in the test. The test consists of five successive time periods, with time duration of T1, dT, T2, dT and T3 respectively. Figure 7.3.65.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states.

Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell 1. The UE is scheduled in designated uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is disabled, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2, dT and T3 shall be as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR3.
- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. During the period from time point A to time point D, the UE shall not be provisioned with any UL grant.
- Thereafter UE switches back to downlink.

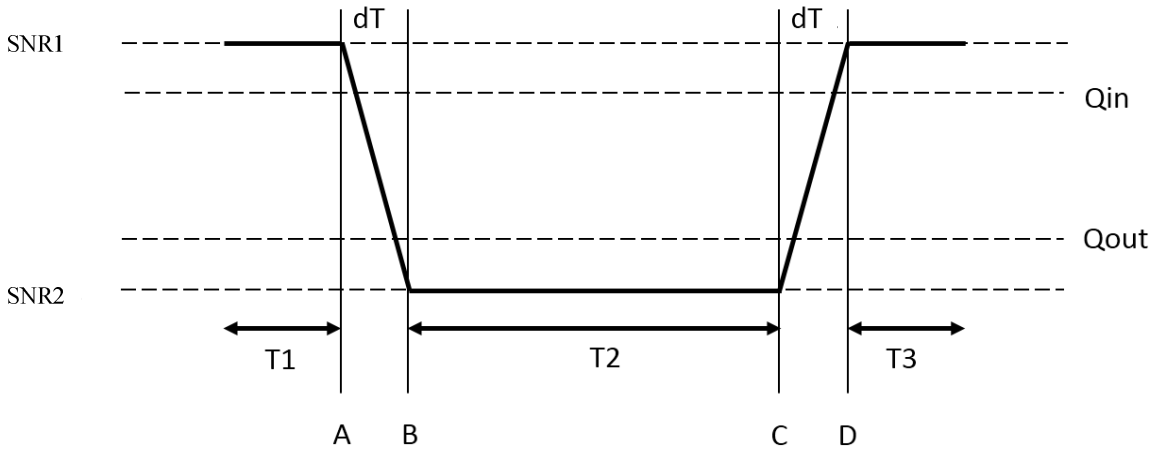

Figure 7.3.65.4-1: SNR variation for in-sync testing without DRX

7.3.65.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E Table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.65.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 without faders using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.65.4.1-1 and 7.3.65.5.1-3.
3. Propagation conditions are set according to Annex B clause B.2
4. Message contents are defined in clause 7.3.65.4.3
5. There is one NB1 Cell and one EUTRA Cell specified in this test. nCell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.65.4.1-1: General test parameters for HD-FDD in-sync test without DRX for UE category NB1 In-Band mode in enhanced coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			nCell 1	NB-IOT cell nCell1 is within E-UTRA cell eCell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		4	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out\_NB\text{-}IoT}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		16	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	40000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	4	
dT		s	1.4	
T2		s	1.84	
dT		s	1.4	
T3		s	4	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.65.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell 1. The UE shall be configured for NPUSCH transmission for every possible uplink sub-frame.

1. Ensure the UE is in State 2A-NB with CP CIoT optimisation according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.65.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the 1st time window dT starts, During dT the SS shall change the SNR as specified in Table 7.3.65.5-1.
4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.65.5-1. T2 starts.
5. When T2 expires the 2nd time window dT starts. During dT the SS shall change the SNR as specified in Table 7.3.65.5-1.

6. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.65.5-1. T3 starts.

7. During T3 the SS shall send the UE continuous grants to transmit on the uplink. The UE is expected to decode the uplink grant, switch to uplink and complete the corresponding uplink transmission. If the SS detects uplink transmissions from the UE according to the subframes scheduled for NPUSCH transmission by the uplink grant, during the period from time point D until T3 expires, the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

8. After T3 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.65.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition "Inband_Different" with the following exceptions:

Table 7.3.65.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.9-2
Default RRC messages and information elements contents exceptions	

7.3.65.5 Test requirement

Table 7.3.65.5.1-1: nCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 In-Band mode in enhanced coverage

Parameter	Unit	nCell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	200				
PRB location within eCell	-	eCell 1 $BW_{channel}$ 5MHz: 17 eCell 1 $BW_{channel}$ 10MHz: 30				
NPDCCH parameters defined in A.10.1		R.27 HD-FDD				
NPDSCH_RA		-3				
NPDSCH_RB		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.65.5.1-2				
SNR Note 5, Note 6	dB	-5.7	Note 7	-17.4	Note 8	-6.3
Propagation condition		AWGN				
Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.65.4-1.
Note 7: The Test system shall reduce it's transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 8: The Test system shall increase it's transmit power in steps of ((SNR1-SNR2) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.65.5.1-2: eCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 In-Band mode in enhanced coverage

Parameter	Unit	eCell 1
		T1-T3
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.4 FDD $BW_{channel}$ 10MHz: NOP.1 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	0
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.65.5.1-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync tests without DRX for UE category NB1 In-Band mode in enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]

During the period from time point D until T3 expiration, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.66 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 Standalone mode in Normal Coverage

7.3.66.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause 7.23.

7.3.66.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of category NB1 and higher.

7.3.66.3 Minimum conformance requirements

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send an out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ $Q_{out\_NB\text{-}IoT}$ evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in TS 36.213. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331. The following table 7.3.66.3-1 defines the $T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$ and $T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$.

Table 7.3.66.3-1 Q_{out} and Q_{in} Evaluation Period in non-DRX for HD-FDD Category NB1 UE

Configured NPDCCH R_{max}	$T_{Evaluate\_Q_{out\_NB\text{-}IoT}}$	$T_{Evaluate\_Q_{in\_NB\text{-}IoT}}$
$R_{max} \leq 64$	400ms	200ms
$R_{max} > 64$	4000ms	2000ms

The normative reference for this requirement is TS 36.133 [4] clause 7.23.2 and A.7.3.66.

7.3.66.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell in the test. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.66.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync requirements can be measured. In the test, DRX configuration is disabled. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2, T3 and T4 are as follows:

- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

Note 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant. The UE shall not be provisioned with any more UL grants until the start of time period T4.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

Note 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

Note 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

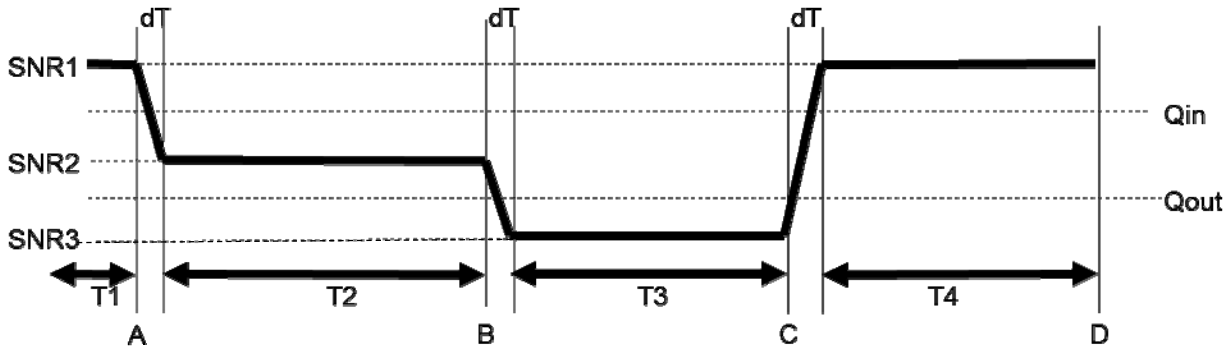

Figure 7.3.66.4-1: SNR variation for out-of-sync testing

7.3.66.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: 200kHz as defined in TS 36.508 [7] clause 8.1.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 7.3.66.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.66.4.3.
5. There is one cell specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.66.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for out-of-sync tests without DRX for UE Category NB1 Standalone mode in normal coverage

Parameter	Unit	Value	Comment
NB-IoT operational mode		**Standalone**	
Active cell		nCell 1	
CP length		Normal	
NPDCCH repetition level R_{max}		8	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.66.3-1
DRX		OFF	
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	3000	T311 is enabled
T1	s	2	
dT	s	0.8	
T2	s	0.4	
dT	s	0.7	
T3	s	0.5	
dT	s	1.4	
T4	s	0.4	
Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: N310, N311, T310 and T311 are defined in TS 36.331. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.			

7.3.66.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.66.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.66.5-1.
4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.66.5-1. T2 starts.
5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1. No more UL grants are given until start of T4.
6. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.66.5-1.
7. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.66.5-1. T3 starts.
8. During T3 the UE is expected to detect OOS and declare RLM.
9. When T3 expires, the 3rd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.66.5-1.
10. When dT expires the SS shall keep the SNR value corresponding to T4 as specified in Table 7.3.66.5-1. T4 starts.

11. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -48.2dBm in the uplink subframe scheduled to transmit NPUSCH during the period T4 the number of failed tests is increased by one.

Otherwise the number of successful tests is increased by one.

12. After T4 expires the UE is switched off and then on. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.

13. Repeat steps 2-12 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.66.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition “Standalone” with the following exceptions:

Table 7.3.66.4.3-1: *SystemInformationBlockType2-NB*

Derivation Path: 36.331 clause 8.1.4.3.3, Table 8.1.4.3.3-1 SystemInformationBlockType2-NB1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2-NB-r13 ::= SEQUENCE {			
ue-TimersAndConstants-r13 SEQUENCE {			
t310-r13	ms0		
n310-r13	n1		
t311-r13	ms3000		
n311-r13	n1		
}			
}			

7.3.66.5 Test requirement

Table A.7.3.66.5-1: Ncell1 specific test parameters for HD-FDD Radio Link Monitoring Test for out-of-sync without DRX for UE Category NB1 Standalone mode in normal coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4
NB-IoT Channel Bandwidth ($BW_{channel}$)	kHz	180						
OCNG Pattern as defined in D.3 Note 1		NOP.3 FDD						
NPDCCH parameters as defined in A.10.1		R.33 HD-FDD						
NPBCH_RA	dB	-3						
NPBCH_RB	dB							
NPSS_RA	dB							
NSSS_RA	dB							
NPDCCH_RA	dB							
NPDCCH_RB	dB							
NPDSCH_RA	dB							
NPDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc}	dBm/15 KHz	-98						
SNR Note 4,5	-	-2.5	Note 6	-8.5	Note 7	-14.7	Note 8	-2.5
Propagation Condition	-	AWGN						
Antenna Configuration	-	2x1						

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2, T3 and T4 are denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure 7.3.66.4-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.67 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 guard band mode in Enhanced Coverage

7.3.67.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause 7.23.

7.3.67.2 Test applicability

This test case applies to all types of NB-IoT HD-FDD UE release 13 and forward of category NB1 and higher.

7.3.67.3 Minimum conformance requirements

Same requirement as in 7.3.66.3.

7.3.67.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell, and one E-UTRA cell in the test. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.67.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync requirements can be measured. In the test, DRX configuration is disabled. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2, T3 and T4 are as follows:

- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

Note 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant. The UE shall not be provisioned with any more UL grants until the start of time period T4.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

Note 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

Note 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

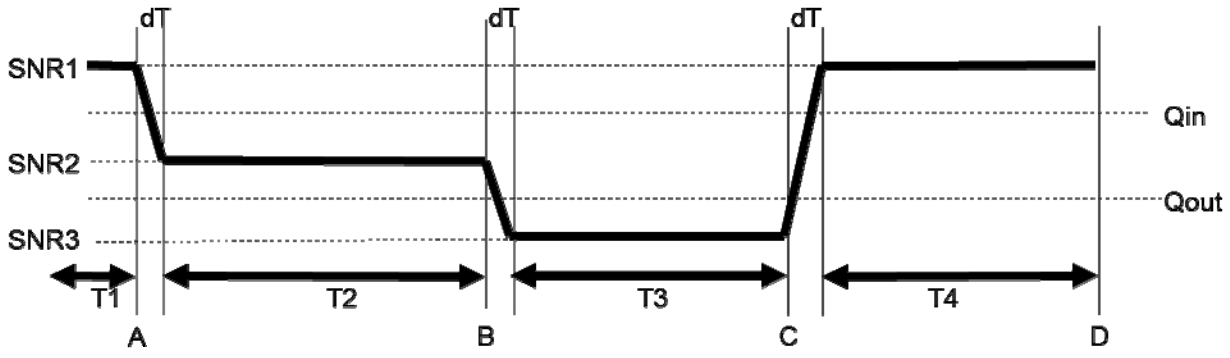

Figure 7.3.67.4-1: SNR variation for in-sync testing with DRX

7.3.67.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1, except for bands within band group FDD_N where 5 MHz bandwidth is used. Ncell bandwidth is as specified in Table 7.3.67.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.10 using only main Tx/Rx antenna and without faders.
2. The general test parameter settings are set up according to Table 7.3.67.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.67.4.3.
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.67.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for out-of-sync tests without DRX for UE Category NB1 Guard band mode in enhanced coverage

Parameter	Unit	Value	Comment
NB-IoT operational mode		Guardband	
Active cell		nCell 1	
CP length		Normal	
NB-IoT RF Channel Number		1	One NB-IoT carrier frequency
NPDCCH repetition level R_{max}		16	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.66.3-1
DRX		OFF	
Layer 3 filtering Note 2		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2	ms	0	T310 is disabled
T311 timer Note 2	ms	3000	T311 is enabled
T1	s	2	
dT	s	0.7	
T2	s	0.4	
dT	s	0.8	
T3	s	0.5	
dT	s	1.4	
T4	s	0.4	
Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: N310, N311, T310 and T311 are defined in TS 36.331. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.			

7.3.67.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.67.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.67.5-1.

4. When dT expires the SS shall keep the SNR value corresponding to T2 as specified in Table 7.3.67.5-1. T2 starts.

5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1. No more UL grants are given until start of T4.

6. When T2 expires, the 2nd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.67.5-1.

7. When dT expires the SS shall keep the SNR value corresponding to T3 as specified in Table 7.3.67.5-1. T3 starts.

8. During T3 the UE is expected to detect OOS and declare RLM.

9. When T3 expires, the 3rd time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.67.5-1.

10. When dT expires the SS shall keep the SNR value corresponding to T4 as specified in Table 7.3.67.5-1. T4 starts.

11. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -48.2dBm in the uplink subframe scheduled to transmit NPUSCH during the period T4 the number of failed tests is increased by one.

Otherwise the number of successful tests is increased by one.

12. After T4 expires the UE is switched off and then on. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.

13. Repeat steps 2-12 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.67.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 and clause 8.1.4.3 using condition “Guardband” with the following exceptions:

Table 7.3.67.4.3-1: *SystemInformationBlockType2-NB*

Derivation Path: 36.331 clause 8.1.4.3.3, Table 8.1.4.3.3-1 SystemInformationBlockType2-NB1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2-NB-r13 ::= SEQUENCE {			
ue-TimersAndConstants-r13 SEQUENCE {			
t310-r13	ms0		
n310-r13	n1		
t311-r13	ms3000		
n311-r13	n1		
}			
}			

7.3.67.5 Test requirement

Table 7.3.67.5-1: Ncell 1 specific test parameters for HD-FDD Radio Link Monitoring Test for out-of-sync without DRX for UE Category NB1 Guard band mode in enhanced coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4
$BW_{channel}$	kHz	180						
PRB location within eCell	-	eCell 1 $BW_{channel}$ 5MHz: 25 eCell 1 $BW_{channel}$ 10MHz: 50						
NPDCCH parameters as defined in A.10.1		R.37 HD-FDD						
NPBCH_RA	dB	-3						
NPBCH_RB	dB							
NPSS_RA	dB							
NSSS_RA	dB							
NPDCCH_RA	dB							
NPDCCH_RB	dB							
NPDSCH_RA	dB							
NPDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc}	dBm/15 KHz	Specified in Table 7.3.67.5-2						
SNR Note 4,5	-	-5.7	Note 6	-10.8	Note 7	-18.0	Note 8	-5.7
Propagation Condition	-	AWGN						
Antenna Configuration	-	2x1						

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNR in time periods T1, T2, T3 and T4 is denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure 7.3.67.4-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.67.5-2: Cell 1 specific test parameters for HD-FDD out-of-sync radio link monitoring test without DRX for UE category NB1 Guard band mode in enhanced coverage

Parameter	Unit	eCell 1
		T1-T4
$BW_{channel}$	MHz	5 or 10
NOCNG Pattern	-	$BW_{channel}$ 5MHz: NOP.5 FDD $BW_{channel}$ 10MHz: NOP.2 FDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1
Note 1: OCNG shall be used such that the eCell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.68

7.3.69 E-UTRAN HD-FDD Early Out-of-sync reporting Test for CE UE in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Minimum conformance requirements contain square brackets (RAN4 dependant)

7.3.69.1 Test purpose

The purpose of this test is to verify that the HD-FDD CE UE configured in CEModeA properly detects an early out of sync event and makes correct reporting of it for the purpose of monitoring the downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN FDD radio link monitoring requirements for Cat-M1 UE defined in clause 7.19 in 36.133[4].

7.3.69.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL and non-BL CE UEs.

7.3.69.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

UE configured with *rlm-ReportConfig* has to

- Estimate the downlink radio link quality and compare it to the thresholds $Q_{E1\_out\_CatM1}$ and $Q_{E2\_in\_CatM1}$ for the purpose of monitoring downlink radio link quality of the PCell.

The threshold $Q_{E1\_out\_CatM1}$ is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to [10]% block error rate of a hypothetical MPDCCH transmission with transmission parameters specified in Table 7.19.2-2.

The threshold $Q_{E2\_in\_CatM1}$ is defined as the level at which the downlink radio link quality can be significantly more reliably received than at $Q_{E1\_out\_CatM1}$ and shall correspond to [2]% block error rate of a hypothetical MPDCCH transmission with transmission parameters specified in Table 7.19.2-2.

Table 7.19.2-2: M-PDCCH transmission parameters for event E1 and event E2 for UE category M1 with CE mode A

Attribute	Event E1	Event E2
DCI format	6-1A	6-1A
Starting OFDM symbols	2; Bandwidth >= 10MHz 3; 3MHz <= Bandwidth < 10MHz 4; Bandwidth = 1.4MHz	2; Bandwidth >= 10MHz 3; 3MHz <= Bandwidth < 10MHz 4; Bandwidth = 1.4MHz
Maximum M-PDCCH repetition level	Rmax/[2] Note1	Rmax/[8] Note1
Aggregation level (ECCE)	$L'_{max-[1]}$ Note2	$L'_{max-[2]}$ Note2
M-PDCCH Transmission type	Distributed	Distributed
NOTE 1: R_{max} is determined by the configurable parameter *mPDCCH-NumRepetition* defined in 36.331 and $R_{max} \geq 2$ to trigger Event E1 and $R_{max} \geq 8$ to trigger Event E2. NOTE 2: L'_{max-1} and L'_{max-2} is derived from the configurable parameter *numberPRB-Pairs* defined in 36.331. L'_{max-1} is 16, 8 and 4, if *numberPRB-Pairs* is 6, 4 and 2, respectively. L'_{max-2} is the aggregation level one level below L'_{max-1}, and L'_{max-2} is 8, 4 and 2, if *numberPRB-Pairs* is 6, 4 and 2, respectively.		

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{out\_CatM1}}$ period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{out\_CatM1}}$ evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Q_{in\_CatM1}}$ period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within $T_{Evaluate\_Q_{in\_CatM1}}$ evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, r_{max}*G).

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

$T_{Evaluate\_Q_{out\_CatM1}} = 5*r_{max}*G$ ms and $T_{Evaluate\_Q_{in\_CatM1}} = 5*r_{max}*G$ ms, provided the below conditions are met, where $r_{max}*G$ is MPDCCH monitoring cycle length and parameters r_{max} and G are as specified in [3]:

$r_{max}*G \geq 80$ ms, and

$G>1$, and

UE is not receiving PDSCH,

otherwise $T_{Evaluate\_Q_{out\_CatM1}} = 400$ ms and $T_{Evaluate\_Q_{in\_CatM1}} = 200$ ms.

A UE configured with *rlm-ReportConfig* has to additionally meet the following requirements

- When the downlink radio link quality of the PCell estimated over the last Q_{out_CatM1} evaluation period becomes worse than the threshold $Q_{E1\_out\_CatM1}$, Layer 1 of the UE shall trigger event E1 and send a report to the higher layers within Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the E1 event indications as specified in TS 36.331 [2].

- When the downlink radio link quality of the PCell estimated over the last Q_{in_CatM1} period becomes better than the threshold $Q_{E2\_in\_CatM1}$, Layer 1 of the UE shall trigger event E2 and send a report to the higher layers within Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the event E2 indications as specified in TS 36.331 [2]. The normative reference for this requirement is TS 36.133 [4] clause 7.19.3.1 and A.7.3.69.

7.3.69.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.69.-1 shows the variation of the downlink SNR in the active cell to emulate early out-of-sync and early in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the RRC parameter *mPDCCH-NumRepetition* is set to 8. In addition, the UE is configured with *rlm-ReportConfig*. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

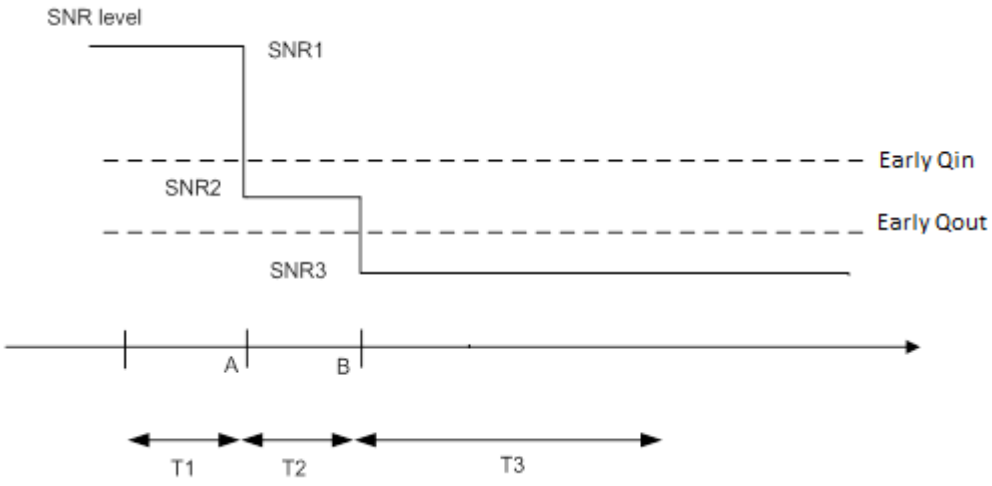

Figure 7.3.69.4-1: SNR variation for early out-of-sync testing

7.3.69.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.52.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.52.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.69.4.1-1: General test parameters for E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Early Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.12 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Early Out of sync threshold $Q_{E1\_out\_CatM1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-2 respectively.
	M-PDCCH aggregation level	eCCE	[8]	
	M-PDCCH repetition level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH corresponding to the early out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.69.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.69.4.1-1 and configuration to detect early-out-of-sync. UE successfully responds with RRC Reconfiguration Complete message.
3. Set the parameters according to T1 in Table 7.3.69.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.69.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.69.5-1. T3 starts.
6. If UE transmits *UEAssistanceInformation* indicating detection of the early-out-of-sync within Q_{out_CatM1} time period, then the number of successful tests is increased by one. Otherwise the number of failed tests is increased by one.
7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.69.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CEModeA activated according to TS 36.508 [7] clause 7.2A.3AA.
9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.69.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.69.4.3-1: Common Exception messages for E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.8-1
Default RRC messages and information elements contents exceptions	

Table 7.3.69.4.3-2: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
EPDCCH-Config-r11 ::= SEQUENCE{			
config-r11{			
setup SEQUENCE {			
setConfigToAddModList-r11 SEQUENCE {	1 entry		
numberPRB-Pairs-v1310 CHOICE{			
setup	n6		
}			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			
}			
}			
}			
}			

Table 7.3.69.4.3-3: *otherConfig:* Additional E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Derivation Path: 36.508 Table 4.6.3-29			
Information Element	**Value/remark**	**Comment**	**Condition**
OtherConfig-r9 ::= SEQUENCE {			
reportProximityConfig-r9 ::= SEQUENCE {			
rlm-ReportConfig-r14 CHOICE {			
Setup SEQUENCE{			
rlmReportTimer-r14	s0		
}			
}			
}			
}			
}			

Table 7.3.69.4.3-4: *UEAssistanceInformation:* Additional E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Derivation Path: 36.508, Table 4.6.1-26			
Information Element	**Value/remark**	**Comment**	**Condition**
UEAssistanceInformation-r11 ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
UEAssistanceInformation-r11-IEs SEQUENCE {			
nonCriticalExtension SEQUENCE {			
rlm-Report-r14 SEQUENCE {			
rlm-Event-r14	earlyOutOfSync		
}			
}			
}			
}			
}			
}			

7.3.69.5 Test requirementTables 7.3.69.4.1-1 and 7.3.69.5-1 define the primary level settings including test tolerances.

Table 7.3.69.5-1: E-UTRAN HD-FDD Early out-of-sync testing for CE UE in CEModeA

Parameter	**Unit**	**Test 1**		
		T1	**T2**	**T3**
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters as defined in A.3.1.3.1		R.7 HD-FDD		
OCNG Pattern defined in A.3.2.1.21 (FDD)		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 5	dB	0.1	-6.8	-15.8
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 3: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 5: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.69.1-1.				

The UE shall compare the downlink radio link quality of the PCell over the last Q_{out_CatM1} evaluation, which is defined in 7.19.3.1, with the threshold $Q_{E1\_out\_CatM}$. When the estimated quality becomes worse than the threshold starting from

time point B, Layer 1 of the UE shall trigger event E1 and send a report to the higher layers within Q_{out_CatM1} evaluation period.

The rate of correct events observed during repeated tests shall be at least 90% with the confidence level of 95%.

7.3.70 to 7.3.87

7.3.88 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

7.3.88.1 Test purpose

The purpose of this test is to verify that the TDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT TDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.88.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2. Applicability requires support for FGI bit 5.

7.3.88.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 7.3.60.3.

7.3.88.4 Test description

Same test description as defined in 7.3.60.4

7.3.88.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 7.3.88.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.88.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.88.4.3
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.88.4.1-1: General test parameters for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Value	Comment
Active cell		nCell 1	
Neighbour cell		eCell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		8	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.60.3-1
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [16]
DRX cycle	ms	256	See Table 7.3.60.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	1000	T311 is enabled
T1	s	5.12	
dT	S	0.8	
T2	s	10.24	
dT	S	0.7	
T3	s	5.12	
dT	S	1.4	
T4	s	5.12	
Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: N310, N311, T310 and T311 are defined in TS 36.331 [2]. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.			

7.3.88.4.2 Test procedure

Same test procedure as in clause 7.3.60.4.2.

7.3.88.4.3 Message contents

Same message contents as in clause 7.3.60.4.3.

7.3.88.5 Test requirement

Table 7.3.88.5-1: nCell specific test parameters for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4

$BW_{channel}$	kHz	180						
PRB location within eCell		eCell 1 $BW_{channel}$ 10MHz: 30						
NPDCCH parameters as defined in A.3.1.5.7		R.14 NB-TDD						
NPBCH_RA	dB	-3						
NPBCH_RB	dB							
NPSS_RA	dB							
NSSS_RA	dB							
NPDCCH_RA	dB							
NPDCCH_RB	dB							
NPDSCH_RA	dB							
NPDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc}	dBm/15 kHz	Specified in Table 7.3.88.5-1a						
SNR Note 4, 5	dB	-2.5	Note 6	-8.5	Note 7	-14.7	Note 8	-2.5
Propagation condition		AWGN						
Configuration		2x1						

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2, T3 and T4 are denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure A.7.3.88.1-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.88.5-1a: eCell 1 specific test parameters for TDD Out-of-sync radio link monitoring test in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	eCell 1
		T1-T4
$BW_{channel}$	MHz	10
NOCNG Pattern	-	$BW_{channel}$ 10MHz: NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.88.5-2: DRX-Configuration for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331 [2]
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.88.5-3: *TimeAlignmentTimer* -Configuration for NB-IoT TDD out-of-sync testing for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [2]

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.89 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

7.3.89.1 Test purpose

The purpose of this test is to verify that the TDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT TDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.89.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 15 and forward of UE Category NB1 and NB2. Applicability requires support for FGI bit 5.

7.3.89.3 Minimum conformance requirements

Same minimum conformance requirements as defined in 7.3.61.3.

7.3.89.4 Test description

Same test description as defined in 7.3.61.4.

7.3.89.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: E-UTRA Bandwidth is 10 MHz, as defined in TS 36.508 [7] clause 4.3.1.1. Ncell bandwidth is as specified in Table 7.3.89.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna and without using the faders.
2. The general test parameter settings are set up according to Table 7.3.89.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.89.4.3
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.89.4.1-1: General test parameters for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	Value	Comment
Active cell		nCell 1	
Neighbour cell		eCell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		16	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.61.3-1
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [16]
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [16]
DRX cycle	ms	256	See Table 7.3.89.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	1000	T311 is enabled
T1	s	5.12	
dT	s	0.7	
T2	s	10.24	
dT	s	0.8	
T3	s	5.12	
dT	s	1.4	
T4	s	5.12	

Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.
Note 2: N310, N311, T310 and T311 are defined in TS 36.331 [2].
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

7.3.89.4.2 Test procedure

Same test procedure as in clause 7.3.61.4.2.

7.3.89.4.3 Message contents

Same message contents as in clause 7.3.61.4.3.

7.3.89.5 Test requirement

Table 7.3.89.5-1: nCell specific test parameters for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	nCell 1						
		T1	dT	T2	dT	T3	dT	T4

$BW_{channel}$	kHz	180							
PRB location within eCell		eCell 1 $BW_{channel}$ 10MHz: 30							
NPDCCH parameters as defined in A.3.1.5.7		R.14 NB-TDD							
NPBCH_RA	dB	-3							
NPBCH_RB	dB								
NPSS_RA	dB								
NSSS_RA	dB								
NPDCCH_RA	dB								
NPDCCH_RB	dB								
NPDSCH_RA	dB								
NPDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc}	dBm/15 kHz	Specified in Table 7.3.89.5-1A							
SNR Note 4, 5	dB	-5.7	Note 6	-10.8	Note 7	-18.0	Note 8	-5.7	
Propagation condition		AWGN							
Antenna Configuration		2x1							

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: Void
Note 3: Void
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2, T3 and T4 are denoted as SNR1, SNR2, SNR3 and SNR1 respectively in figure A.7.3.89.1-1.
Note 6: The Test system shall reduce its transmit power in steps of ((SNR2-SNR1) / (10*dT)) dB every 100ms until SNR2 is achieved at the end of dT.
Note 7: The Test system shall reduce its transmit power in steps of ((SNR3-SNR2) / (10*dT)) dB every 100ms until SNR3 is achieved at the end of dT.
Note 8: The Test system shall increase its transmit power in steps of ((SNR1-SNR3) / (10*dT)) dB every 100ms until SNR1 is achieved at the end of dT.

Table 7.3.89.5-1a: eCell 1 specific test parameters for TDD Out-of-sync radio link monitoring test in DRX for UE category NB1 In-band mode in enhanced coverage

Parameter	Unit	eCell 1
		T1-T4
$BW_{channel}$	MHz	10
NOCNG Pattern	-	$BW_{channel}$ 10MHz: NOP.1 TDD
PBCH_RA	dB	-3
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s / N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		2x1

Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.

Table 7.3.89.5-2: DRX-Configuration for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331 [2]
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.89.5-3: *TimeAlignmentTimer* -Configuration for TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [2]

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4.

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.4 Interruption for Dual Connectivity

7.4.1 E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

7.4.1.1 Test purpose

To verify Dual Connectivity UE's ability to complete PCELL interruption during PSCell DRX transitions within the missed ACK/NACK rate for FDD PCell in dual connectivity requirements.

7.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity. Applicability requires support for FGI bit 5.

7.4.1.3 Minimum conformance requirements

When PCell is in non-DRX and PSCell is in DRX, interruptions on PCell and the activated SCell in MCG if configured due to transitions from active to non-active and from non-active to active during PSCell DRX are allowed with up to 1% probability of missed ACK/NACK when the configured PSCell DRX cycle is less than 640 ms, and 0.625% probability of missed ACK/NACK is allowed when the configured PSCell DRX cycle is 640 ms or longer. Each interruption shall not exceed 1 subframe.

7.4.1.4 Test description

7.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.4.1.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings are set up according to Table 7.4.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.4.1.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 7.4.1.4.1-1: General test parameters for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test.
Active PCell		Cell1	PCell on RF channel number 1.
Configured PSCell		Cell2	PSCell on RF channel number 2.
CP length		Normal	
DRX		ON	DRX related parameters are defined in Table 7.4.1.5-2
Measurement gap pattern Id		OFF	
T1	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: A UE capable of both synchronous and asynchronous DC operations is only required to pass this test case in accordance with the principle defined in section A.3.11.			

7.4.1.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. PCell is continuously scheduled in DL while PSCell is not scheduled and has DRX configured. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Cell1 shall be configured as PCell and Cell2 shall be configured as PSCell. Prior to start of T1 the DRX inactivity timer for the PSCell have already expired. During T1 the UE shall be continuously scheduled on PCell while not scheduled on PSCell

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall transmit an RRCConnectionReconfiguration message to configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 7.4.1.4.3.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS would ensure continuous transmission on PCell , while not scheduling on PSCell at least for 200 ms to ensure inactivity timer is expired on the UE for PSCell.

5. Set the parameters according to T1 in Table 7.4.1.5-1. Propagation conditions are set according to Annex B.1.1. T1 starts.

6. SS schedules on PCell continuously and UE shall start sending ACK/NACK reports. The SS shall monitor ACK/NACK/DTX on PCell.

7. If more than 99% of uplink transmissions are received by SS then count a success for the event “ACK/NACK”. Otherwise count a fail for the event “ACK/NACK”.

8. If no two consecutive DTX is observed by the SS, then count a success for the event “DTX”. Otherwise count a fail for the event “DTX”.

9. After the RRC connection release, the SS:

   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),

   or

   - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

10. Repeat step 3-9 until a test verdict has been achieved

Each of the events "ACK/NACK" and "DTX" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

7.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.4.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 7.4.1.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_Add_SCG_DRB
}			
}			
}			

7.4.1.5 Test requirement

Table 7.4.1.4.1-1 and 7.4.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous cells test.

Table 7.4.1.5-1 : Cell specific test parameters for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Cell1	Cell2
		T1	T1
E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_PB	dB		
PDCCH_RA	dB		
PDCCH_PB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-101	-101
$\hat{E}_s / N_{oc}$	dB	19.6	19.6
$\hat{E}_s / I_{ot}$	dB	19.6	19.6
RSRP Note 3	dBm/15 KHz	-81.4	-81.4
SCH_RP Note 3	dBm/15 KHz	-81.4	-81.4
Io Note 3	dBm/Ch BW	-53.56 +10log ($N_{RB,c}$ /50)	-53.56 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low
Time offset to cell1 Note 4	µs	-	33

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.4.1.5-2 : DRX-Configuration for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer Note 1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	Sf160	
shortDRX	disable	disable	
Note 1: UE is continuously scheduled in PCell			

The UE shall be continuously scheduled in PCell during the entire length of T1. UE shall not be scheduled in PSCell during T1. During the time duration T1 the UE shall transmit at least 99% of ACK/NACK on PCell.

The UE shall not miss transmitting two consecutive ACK/NACK.

The rate of correct events observed during repeated tests shall be at least 90%.

7.4.2 E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

7.4.2.1 Test purpose

To verify Dual Connectivity UE's ability to complete PCELL interruption during PSCell DRX transitions within the missed ACK/NACK rate for TDD PCell in dual connectivity requirements.

7.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Dual Connectivity. Applicability requires support for FGI bit 5.

7.4.2.3 Minimum conformance requirements

When PCell is in non-DRX and PSCell is in DRX, interruptions on PCell and the activated SCell in MCG if configured due to transitions from active to non-active and from non-active to active during PSCell DRX are allowed with up to 1% probability of missed ACK/NACK when the configured PSCell DRX cycle is less than 640 ms, and 0.625% probability of missed ACK/NACK is allowed when the configured PSCell DRX cycle is 640 ms or longer. Each interruption shall not exceed 1 subframe.

7.4.2.4 Test description

7.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.4.2.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings are set up according to Table 7.4.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.4.2.4.3.

5. There are two E-UTRA TDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 7.4.2.4.1-1: General test parameters for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test.
Active PCell		Cell1	PCell on RF channel number 1.
Configured PSCell		Cell2	PSCell on RF channel number 2.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to cell 1
Uplink-downlink configuration		1	As specified in table 4.2-1 in TS 36.211. Applicable to Cell1
CP length		Normal	As specified in table 4.2-2 in TS 36.211. Applicable to Cell1
DRX		ON	DRX related parameters are defined in Table 7.4.2.5-2
Measurement gap pattern Id		OFF	
T1	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: A UE capable of both synchronous and asynchronous DC operations is only required to pass this test case in accordance with the principle defined in section A.3.11.			

7.4.2.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. PCell is continuously scheduled in DL while PSCell is not scheduled and has DRX configured. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Cell1 shall be configured as PCell and Cell2 shall be configured as PSCell. Prior to start of T1 the DRX inactivity timer for the PSCell have already expired. During T1 the UE shall be continuously scheduled on PCell while not scheduled on PSCell

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall transmit an RRCConnectionReconfiguration message to configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 7.4.4.3.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS would ensure continuous transmission on PCell , while not scheduling on PSCell at least for 200 ms to ensure inactivity timer is expired on the UE for PSCell.

5. Set the parameters according to T1 in Table 7.4.2.5-1. Propagation conditions are set according to Annex B.1.1. T1 starts.

6. SS schedules on PCell continuously and UE shall start sending ACK/NACK reports. The SS shall monitor ACK/NACK/DTX on PCell.

7. If more than 99% of uplink transmissions are received by SS then count a success for the event “ACK/NACK”. Otherwise count a fail for the event "ACK/NACK".

8. If no two consecutive DTX is observed by the SS, then count a success for the event “DTX”. Otherwise count a fail for the event "DTX".

9. After the RRC connection release, the SS:

   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),

   or

   - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

10. Repeat step 3-9 until a test verdict has been achieved.

Each of the events “ACK/NACK” and “DTX” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

7.4.2.4.3 Message contents

Table 7.4.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 7.4.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_Add_SCG_DRB
}			
}			
}			

7.4.2.5 Test requirement

Table 7.4.2.4.1-1 and 7.4.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous cells test.

Table 7.4.2.5-1 : Cell specific test parameters for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Cell1	Cell2
		T1	T1
E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.7 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_PB	dB		
PDCCH_RA	dB		
PDCCH_PB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-101	-101

$\hat{E}_s / N_{oc}$	dB	19.6	19.6
$\hat{E}_s / I_{ot}$	dB	19.6	19.6
RSRP Note 3	dBm/15 KHz	-81.4	-81.4
SCH_RP Note 3	dBm/15 KHz	-81.4	-81.4
Io Note 3	dBm/Ch BW	-53.56 +10log ($N_{RB,c}$ /50)	-53.56 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low
Time offset to cell1 Note 4	µs	-	33

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.4.2.5-2 : DRX-Configuration for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer Note 1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	Sf160	
shortDRX	disable	disable	

Note 1: UE is continuously scheduled in PCell

The UE shall be continuously scheduled in PCell during the entire length of T1. UE shall not be scheduled in PSCell during T1. During the time duration T1 the UE shall transmit at least 99% of ACK/NACK on PCell.

The UE shall not miss transmitting two consecutive ACK/NACK.

The rate of correct events observed during repeated tests shall be at least 90%.

7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

7.4.3.1 Test Purpose

The purpose of this test is to verify that the UE fulfils the requirement on interruptions on PCell at transitions between active and non-active during DRX in TS36.133 section 7.12.2.

7.4.3.2 Test Applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity. Applicability requires support for FGI bit 5.

7.4.3.3 Minimum Conformance Requirement

When PCell is in non-DRX and PSCell is in DRX, interruptions on PCell and the activated SCell in MCG if configured due to transitions from active to non-active and from non-active to active during PSCell DRX are allowed with up to 1% probability of missed ACK/NACK when the configured PSCell DRX cycle is less than 640 ms, and 0.625% probability of missed ACK/NACK is allowed when the configured PSCell DRX cycle is 640 ms or longer. Each interruption shall not exceed 1 subframe.

7.4.3.4 Test Description

7.4.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.4.3.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings are set up according to Table 7.4.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.4.3.4.3.
5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 7.4.3.4.1-1: General test parameters for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active Cell		Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length		Normal	
DRX on Cell1		OFF	
DRX on Cell2	ms	320	
Filter coefficient		0	L3 filtering is not used
T1	s	5	
Note 1: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.11.			

7.4.3.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. PCell is continuously scheduled in DL while PSCell is not scheduled and has DRX configured. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Cell1 shall be configured as PCell and Cell2 shall be configured as PSCell. Prior to start of T1 the DRX inactivity timer for the PSCell has already expired. During T1 the UE shall be continuously scheduled on PCell while not scheduled on PSCell

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall transmit an RRCConnectionReconfiguration message to configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 7.4.4.3.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS would ensure continuous transmission on PCell, while not scheduling on PSCell at least for 200 ms to ensure inactivity timer is expired on the UE for PSCell.

5a. Set the parameters according to T1 in Table 7.4.3.5-1. Propagation conditions are set according to Annex B.1.1. T1 starts.

6. SS schedules on PCell continuously and UE shall start sending ACK/NACK reports. The SS shall monitor ACK/NACK/DTX on PCell.

7. If more than 99% of uplink transmissions are received by SS then count a success for the event “ACK/NACK”. Otherwise count a fail for the event "ACK/NACK".

8. If no two consecutive DTX is observed by the SS, then count a success for the event “DTX”. Otherwise count a fail for the event "DTX".

9. After the RRC connection release, the SS:

   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),

   or

   - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

10. Repeat step 3-9 until a test verdict has been achieved.

Each of the events “ACK/NACK” and “DTX” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

7.4.3.4.3 Message contents

Table 7.4.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in asynchronous DC requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 7.4.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD interruption at transitions between active and non-active during DRX in asynchronous dual connectivity requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_Add_SCG_DRB
}			
}			
}			

7.4.3.5 Test Requirement

Table 7.4.3.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in asynchronous dual connectivity cells test.

Table 7.4.3.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Parameter	Unit	Cell 1	Cell 2
		T1	T1

E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100
PDSCH parameters		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	-
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_PB	dB		
PDCCH_RA	dB		
PDCCH_PB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-101	-101
$\hat{E}_s / N_{oc}$	dB	19.6	19.6
$\hat{E}_s / I_{ot}$	dB	19.6	19.6
RSRP Note 3	dBm/15 KHz	-81.4	-81.4
SCH_RP Note 3	dBm/15 KHz	-81.4	-81.4
Io Note 3	dBm/Ch BW	-53.56+10log ($N_{RB,c}$ /50)	-53.56+TT+10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low
Receive timing offset to Cell1 Note 4	µs	-	500

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.4.3.5-2: DRX-Configuration for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Field	PSCell	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf320	
shortDRX	disable	

Note: For further information see clause 6.3.2 in TS 36.331.

Table 7.4.3.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Field	PSCell	Comment
	Value	
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall be scheduled on PCell continuously during the whole time duration T1. During time durations T1, at least 99% of all expected ACK/NACKs shall be transmitted on PCell by the UE.

Each interruption shall not exceed 1 subframe.

The rate of correct events observed during repeated tests shall be at least 90%.

7.5 Proximity-based Services

7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Call procedure of the test case needs to be tweaked

- Test case applicability is undefined.

- Message contents are TBD.

- Connection diagrams are TBD

- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.1.1 Test purpose

To verify the timing requirements of a UE for ProSe Direct Discovery transmissions when PCell downlink timing is used as a reference.

7.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.1.3 Minimum conformance requirements

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED). The sidelink transmissions takes place $(N_{\text{TA,SL}} + N_{\text{TA offset}}) \cdot T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{\text{TA offset}}$ is specified in Section 8.1 of [9]. The value of $N_{\text{TA,SL}}$ differs between sidelink channels and signals, and is either $N_{\text{TA, SL}} = N_{\text{TA}}$ or $N_{\text{TA, SL}} = 0$ as specified in Section 9.9 of [9].

The normative reference for this requirement is TS 36.133 [4] clause 7.16.2.1 and A.7.5.1.

Table 7.5.1-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

7.5.1.4 Test description

7.5.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting PSDCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode 4 is activated.
2. Set the parameters according to Test 1 in Tables 7.5.1.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.5.1.5-2 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
4. The SS adjusts the downlink timing for Cell 1 to a delay of $+32 \times T_S$ (approximately +1 μs) compared to that in step 3.
5. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.5.1.5-2. For that purpose, the PSDCH transmission that takes place at least after the first DRX ON duration after downlink timing of Cell 1 is changed is used.
6. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

7.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.1.5 Test requirement

Table 7.5.1.5-1 defines the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.5.1.5-2, defines the UE uplink timing include Test Tolerances.

Table 7.5.1.5-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table C.3.4.2-1.
ProSe Direct Discovery resource pool configuration		As specified in Table H.6.1.1-1 (Configuration #1)	IE values unless specified otherwise in this test.
PDCCH/PCFICH/PHICH Reference measurement channel Note1		R.11 FDD	
OCNG Pattern Note2		OP.16 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA Note3			
OCNG_RB Note3			
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	3.30	
RSRP Note4	dBm/15 kHz	-94.7	
SCH_RP Note 4	dBm/15 kHz	-94.7	
Propagation condition		AWGN	

Note 1: For the reference measurement channels, see clause A.1.
Note 2: For the OCNG pattern, see clause D.1.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE transmit timing offset shall be within the requirements in Table 7.5.1.5-2.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.5.1.5-2: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

7.5.2 FFS

7.5.3 E-UTRAN FDD – Interruptions due to ProSe Direct Discovery

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Call procedure of the test case needs to be tweaked
- Test case applicability is undefined.
- Message contents are TBD.
- Connection diagrams are TBD
- Annex E updates are pending.
- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.3.1 Test purpose

To verify that the UE is able to complete PCELL interruption due to ProSe Direct discovery.

7.5.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.3.3 Minimum conformance requirements

For this test, the UE is triggered by the test loop function or the upper layers to monitor ProSe Direct Discovery.

The test parameters are given in Table 7.5.3.3-1 and Table 7.5.3.3-2 below. There is one active cell (PCell) in this test and 24 active Sidelink transmissions in this test (with 12 active Sidelink UEs per configured discovery subframe). Two tests (Test 1 and Test 2) are defined to verify interruptions due to synchronous (Test 1) and asynchronous (Test 2) ProSe Direct Discovery.

The tests consist of three successive time periods, with time duration of T1, T2 and T3 respectively.

During T1, the UE is in RRC_IDLE and monitoring the ProSe Direct Discovery announcements from other active Sidelink UEs on the ProSe Direct Discovery resources.

During T2, the test system establishes a RRC connection with the UE. No PDSCH traffic is scheduled for UE during T2, and the UE is expected to transmit *SidelinkUEInformation* indicating *discRxInterest* during T2. On reception of *SidelinkUEInformation*, the test system shall RRC reconfiguration message to the UE and wait for the UE to respond with RRC reconfiguration complete message before transitioning to T3. If the UE does not transmit *SidelinkUEInformation* for up to [2] sec, the test system shall transition to T3.

During T3, the UE is scheduled with PDSCH traffic on PCell downlink. The test system will count the missed ACK/NACKs during T3 to verify the allowed interruptions during ProSe Direct Discovery.

The normative reference for this requirement is TS 36.133 [4] clause 7.16.3.1 and A.7.5.3.

Table 7.5.3.3-1: Test parameters for interruption due to ProSe Direct Discovery tests

Parameter	Unit	Value		Comment
		Test 1	Test 2	
E-UTRA RF Channel Number		1		
Channel Bandwidth ($BW_{channel}$)	MHz	5		
Active cell		Cell 1		E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal		
T1	s	5.12		
T2	s	Up to receiving RRC reconfiguration setup complete from the UE, or up to [2] sec if UE does not transmit *SidelinkUEInformation* during this period.		
T3	s	10.24		

Table 7.5.3.3-2: ProSe Direct Discovery configuration for interruption due to ProSe Direct Discovery tests

Parameter	Unit	Value		Comment
		Test 1	Test 2	
E-UTRA RF Channel Number		1		UL carrier frequency
Channel Bandwidth ($BW_{channel}$)	MHz	5		
ProSe Direct Discovery resource pool configuration		As specified in Table H.6.1.1-1 (Configuration #1)	As specified in Table H.6.1.1-2 (Configuration #2)	IE values unless specified otherwise in this test.
Active Sidelink UEs Configuration		PDP.1.FDD As specified in Table A.6.2-1	PDP.2.FDD As specified in Table A.6.2-1	Transmitting ProSe Direct Discovery (Test 1 and 2) and SLSS (for Test 2)

Table 7.5.3.3-3: Cell specific test parameters for interruption due to ProSe Direct Discovery tests

Parameter		Unit	Cell 1		
			T1	T2	T3
E-UTRA RF Channel Number			1		
$BW_{channel}$		MHz	5		
UE RRC state			IDLE	CONNECTED	
Paging configuration	defaultPagingCycle		rf256	N/A	
	nB		T / 32		
DRX			N/A	OFF	
PDSCH Reference measurement channel defined in A.3.1.1.1 Note1			N/A	None	R.5 FDD
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 Note1			R.11 FDD		
OCNG Pattern			OP.16 FDD		
PBCH_RA		dB	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note 1					
OCNG_RB Note 1					
N_{oc} Note2		dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$		dB	16		
RSRP Note3		dBm/15 kHz	-82		
SCH_RP Note 3		dBm/15 kHz	-82		
Propagation Condition			AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

7.5.3.4 Test description

7.5.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.3.4.2 Test procedure

There is one active cell (PCell) in this test and 24 active Sidelink transmissions in this test (with 12 active Sidelink UEs per configured discovery subframe). Two tests (Test 1 and Test 2) are defined to verify interruptions due to synchronous (Test 1) and asynchronous (Test 2) ProSe Direct Discovery.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS.
2. Set the parameters according to Test 1 time period T1 in Tables 7.5.3.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. UE is in idle mode in T1 and is monitoring ProSe Direct Discovery announcements from other active Sidelink UEs.
4. On the expiry of T1, TE pages the UE and establishes a RRC Connection with the UE. TE doesn't schedule any PDSCH traffic to the UE.
5. UE is expected to send a Sidelink UEInformation indicating discRxInterest, upon reception, TE is expected to send a RRC Connection reconfiguration message to the UE.
6. Once the UE sends RRC reconfiguration complete message or [2] secs have elapsed after start of T2, start T3.
7. During T3, TE schedules PDSCH traffic on PCell and counts ACK/NACK and record the same.
8. For Test 1, at least 98.75% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. For Test 2, at least 97.5% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE.
9. Repeat steps 1 to 8 for Test 2.
10. A UE is considered pass if it meets the test requirements defined in 7.5.3.5 for both Test 1 and Test 2.

7.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.3.5 Test requirement

Table 7.5.3.5-1 define the primary level settings including test tolerances for interruptions due to ProSe Direct discovery.

Table 7.5.3.5-1: Cell specific test requirement parameters for interruption due to ProSe Direct Discovery tests

Parameter		Unit	Cell 1		
			T1	T2	T3
E-UTRA RF Channel Number			1		
$BW_{channel}$		MHz	5		
UE RRC state			IDLE	CONNECTED	
Paging configuration	defaultPagingCycle		rf256	N/A	
	nB		T / 32		
DRX			N/A	OFF	
PDSCH Reference measurement channel defined in A.3.1.1.1 Note1			N/A	None	R.5 FDD
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 Note1			R.11 FDD		
OCNG Pattern			OP.16 FDD		
PBCH_RA		dB	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note 1					
OCNG_RB Note 1					
N_{oc} Note2		dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$		dB	16		
RSRP Note3		dBm/15 kHz	-82 +TT		
SCH_RP Note 3		dBm/15 kHz	-82		
Propagation Condition			AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall be scheduled on PCell continuously during T3.

In Test 1, at least 98.75% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACKs can occur only on subframe ‘n’, if either n±1 subframe is a discovery subframe, or if n-3, or n-5 is a discovery subframe.

NOTE 1: For the test configuration in Table 7.5.3.5-1, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 159, 163, 162, 166, corresponding to allowed interruptions on subframe 159 and 162.

In Test 2, at least 97.5% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACK can occur only on subframe ‘n’, if either n±5 subframe is a discovery or SLSS subframe, or if n+1, or n-9 is a discovery or SLSS subframe.

NOTE 2: For the test configuration in Table 7.5.3.5-1, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 135, 139, 145, 149, 155, 159, 166, 170, corresponding to allowed interruptions on subframes 135, 145, 155 and 166.

7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Call procedure of the test case needs to be tweaked

- Test case applicability is undefined.

- Message contents are TBD.

- Connection diagrams are TBD

- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.4.1 Test purpose

To verify the timing requirements of a UE for ProSe Direct Communication transmissions when PCell downlink timing is used as a reference.

7.5.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.4.3 Minimum conformance requirements

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED). The sidelink transmissions takes place $(N_{\text{TA,SL}} + N_{\text{TA offset}}) \cdot T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{\text{TA offset}}$ is specified in Section 8.1 of [9]. The value of $N_{\text{TA,SL}}$ differs between sidelink channels and signals, and is either $N_{\text{TA, SL}} = N_{\text{TA}}$ or $N_{\text{TA, SL}} = 0$ as specified in Section 9.9 of [9].

The normative reference for this requirement is TS 36.133 [4] clause 7.16.2.1.1 and A.7.5.4.

Table 7.5.4-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

7.5.4.4 Test description

7.5.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.4.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting PSDCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode 4 is activated.
2. Set the parameters according to Test 1 in Tables 7.5.4.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall check that the ProSe UE SLSS transmit timing offset is within the limits specified in Table 7.5.4.5-2 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
4. The SS adjusts the downlink timing for Cell 1 to a delay of $+32 \times T_S$ (approximately +1 μs) compared to that in step 3.
5. After waiting for one SLSS period (40ms), the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.5.4.5-2.
6. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

7.5.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.4.5 Test requirement

Table 7.5.4.5-1 defines the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.5.4.5-2, define the UE uplink timing include Test Tolerances.

Table 7.5.4.5-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	Note 5
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table C.3.4.2
ProSe Direct Communication configuration		As specified in Table H.6.1.2-1: (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		ON	Configured
PDCCH/PCFICH/PHICH Reference measurement channel Note1		5 MHz: R.11 FDD 10 MHz: R.6 FDD	
OCNG Pattern Note2		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA Note3			
OCNG_RB Note3			
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	3.30	
RSRP Note4	dBm/15 kHz	-94.7	
SCH_RP Note 4	dBm/15 kHz	-94.7	
Propagation condition		AWGN	

Note 1: For the reference measurement channels, see clause A.3.1.
Note 2: For the OCNG pattern, see clause A.3.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: This test is according to the principle defined in section A.3.12.3.

The UE transmit timing offset shall be within the requirements in Table 7.5.4.5-2.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.5.4.5-2: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

7.6 Interruption for carrier aggregation

7.6.1 E-UTRAN FDD-TDD CA interruption at SRS carrier based switching

7.6.1.1 Test purpose

The purpose of this test is to verify UE's ability to complete PCC interruption during carrier based SRS switching to one PUSCH-less SCC.

7.6.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 14 and forward that support E-UTRA FDD and TDD CA with FDD as PCell and SRS switching between component carriers.

7.6.1.3 Minimum conformance requirements

The interruption on PCC and each of the activated SCCs during the switching to the PUSCH-less SCC shall not exceed 2 subframes including the first subframe where SRS transmission is configured on the PUSCH-less SCC.

The interruption on PCC and each of the activated SCCs during the switching from the PUSCH-less SCC shall not exceed 2 subframes including the last subframe where SRS transmission is configured on the PUSCH-less SCC.

The normative reference for this requirement is TS 36.133 [4] clause 7.8.2.13 and A.7.6.1.

7.6.1.4 Test description

7.6.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.6.1.5-1 as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings are set up according to Table 7.6.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.6.1.4.3.
5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.6.1.4.1-1: General test parameters for E-UTRAN FDD-TDD CA interruption at SRS carrier based switching

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
Filter coefficient		0	L3 filtering is not used
T1	s	5	
T2	ms	40	UE shall perform SRS switching during T2
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.			

7.6.1.4.2 Test procedure

The test consists of two cells: Cell1 is PCell on the TDD primary component carrier, Cell2 is activated SCell on the TDD secondary component carrier which operates in downlink without PUCCH/PUSCH. The UE is configured with the SRS switching between PCell and SCell. The test consists of two successive time periods, with duration of T1 and T2. During T1 the UE shall be continuously scheduled on PCell. Immediately at the beginning of T2, a PDCCH with SRS-TPC-RNTI is sent to the UE to initiate SRS switching.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A, with the message content exceptions defined in clause 7.6.1.4.3.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Table 7.6.1.5-1. Propagation conditions are set according to Annex B.1.1. T1 starts.
6. SS schedules on PCell continuously and UE shall start sending ACK/NACK reports. The SS shall monitor ACK/NACK/DTX on PCell.
7. When T1 expires, the SS shall transmit a PDCCH with SRS-TPC-RNTI to trigger SRS transmission on SCell immediately.
8. During T2 if no more than 6 ACK/NACK loss are detected by SS then count a success for the event. Otherwise count a fail for the event.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 3-10 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

7.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.6.1.4.3-1: *SoundingRS-UL-ConfigCommon* in step 1: Additional E-UTRAN FDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.3-21			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc8		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			

Table 7.6.1.4.3-2: *SoundingRS-UL-ConfigDedicated* in step 1: Additional E-UTRAN FDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.3-22			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-ConfigIndex	47		
}			
}			

Table 7.6.1.4.3-3: *RRCConnectionReconfiguration* in step 3: Additional E-UTRAN FDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.1-8, condition SCell_AddMod

Table 7.6.1.4.3-4: *SCellToAddMod-r10-DEFAULT* (in Table 7.6.1.4.3-3)

Derivation Path: 36.508 Table 4.6.3-19D, condition SRS-Switching

Table 7.6.1.4.3-5: *RadioResourceConfigCommonSCell-r10* (in Table 7.6.1.4.3-3)

Derivation Path: 36.508 Table 4.6.3-13A, condition SRS-Switching			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r14 SEQUENCE {			
soundingRS-UL-ConfigCommon-r14 SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc8		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
}			

Table 7.6.1.4.3-6: *PhysicalConfigDedicatedSCell-r10* (in Table 7.6.1.4.3-3)

Derivation Path: 36.508 Table 4.6.3-6A, condition SRS-Switching			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-PeriodicConfigDedicatedList-r14	Not present		
soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE {			
srs-CC-SetIndexList-r14	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r14 CHOICE {			
setup SEQUENCE {			
srs-ConfigIndexAp-r10	47		
srs-ConfigApDCI-Format4-r10	Not present		
srs-ActivateAp-r10 CHOICE {			
srs-ConfigApDCI-Format0-r10 SEQUENCE {			
srs-AntennaPortAp-r10	an1		
srs-BandwidthAp-r10	bw5		
freqDomainPositionAp-r10	0		
transmissionCombAp-r10	0		
cyclicShiftAp-r10	cs0		
}			
srs-ConfigApDCI-Format1a2b2c-r10 SEQUENCE {			
srs-AntennaPortAp-r10	an1		
srs-BandwidthAp-r10	bw5		
freqDomainPositionAp-r10	0		
transmissionCombAp-r10	0		
cyclicShiftAp-r10	cs0		
}			
}			
}			
}			
}			
}			

7.6.1.5 Test requirement

Table 7.6.1.4.1-1 and 7.6.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD CA interruption at SRS carrier based switching.

Table 7.6.1.5-1: Cell specific test parameters for E-UTRAN FDD-TDD CA interruption at SRS carrier based switching

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
Special subframe configuration		-		6	
Uplink-downlink configuration		-		1	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		5MHz:18-24 10MHz:13-37 20MHz:47-52	
PDSCH parameters: DL Reference Measurement Channel as defined in A.1.1 and A.1.2		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel as defined in A.2.1 and A.2.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Pattern defined in D.1 and D.2		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98		-98	
RSRP Note 3	dBm/15 kHz	-82	-82	-82	-82
$\hat{E}_s / I_{ot}$	dB	16	16	16	16
SCH_RP Note 3	dBm/15 kHz	-82	-82	-82	-82
$\hat{E}_s / N_{oc}$	dB	16	16	16	16
Io Note 3	dBm/Ch BW	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
timing offset to cell1	μs	-		0	
Time alignment error relative to cell 1 Note 5	μs	-		≤ TAE	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are

not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation

Table 7.6.1.5-2: Sounding Reference Symbol Configuration for E-UTRAN FDD-TDD CA interruption at SRS carrier based switching

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc8	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	47	SRS periodicity of 40ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331.		

The UE shall be continuously scheduled in PCell throughout the test and during the time duration T2, at most 6 ACK/NACK loss on PCell shall be detected.

The rate of correct events observed during repeated tests shall be at least 90%.

7.6.2 E-UTRAN TDD-TDD CA interruption at SRS carrier based switching

7.6.2.1 Test purpose

The purpose of this test is to verify UE's ability to complete PCC interruption during carrier based SRS switching to one PUSCH-less SCC.

7.6.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 14 and forward that support E-UTRA TDD CA and SRS switching between component carriers.

7.6.2.3 Minimum conformance requirements

The interruption on PCC and each of the activated SCCs during the switching to the PUSCH-less SCC shall not exceed 2 subframes including the first subframe where SRS transmission is configured on the PUSCH-less SCC.

The interruption on PCC and each of the activated SCCs during the switching from the PUSCH-less SCC shall not exceed 2 subframes including the last subframe where SRS transmission is configured on the PUSCH-less SCC.

The normative reference for this requirement is TS 36.133 [4] clause 7.8.2.13 and A.7.6.2.

7.6.2.4 Test description

7.6.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.6.2.5-1 as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings are set up according to Table 7.6.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.6.2.4.3.

5. There are two E-UTRA TDD carriers with one cell on each E-UTRA TDD carrier specified in the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.6.2.4.1-1: General test parameters for E-UTRAN TDD-TDD CA interruption at SRS carrier based switching

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
Filter coefficient		0	L3 filtering is not used
T1	s	5	
T2	ms	40	UE shall perform SRS switching during T2
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.			

7.6.2.4.2 Test procedure

The test consists of two cells: Cell1 is PCell on the TDD primary component carrier, Cell2 is activated SCell on the TDD secondary component carrier which operates in downlink without PUCCH/PUSCH. The UE is configured with the SRS switching between PCell and SCell. The test consists of two successive time periods, with duration of T1 and T2. During T1 the UE shall be continuously scheduled on PCell. Immediately at the beginning of T2, a PDCCH with SRS-TPC-RNTI is sent to the UE to initiate SRS switching.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A, with the message content exceptions defined in clause 7.6.2.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 7.6.2.5-1. Propagation conditions are set according to Annex B.1.1. T1 starts.

6. SS schedules on PCell continuously and UE shall start sending ACK/NACK reports. The SS shall monitor ACK/NACK/DTX on PCell.

7. When T1 expires, the SS shall transmit a PDCCH with SRS-TPC-RNTI to trigger SRS transmission on SCell immediately.

8. During T2 if no more than 4 ACK/NACK loss are detected by SS then count a success for the event. Otherwise count a fail for the event.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS:

- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 3-10 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

7.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.6.2.4.3-1: *SoundingRS-UL-ConfigCommon* in step 1: Additional E-UTRAN TDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.3-21			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc8		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			

Table 7.6.2.4.3-2: *SoundingRS-UL-ConfigDedicated* in step 1: Additional E-UTRAN TDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.3-22			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-ConfigIndex	47		
}			
}			

Table 7.6.2.4.3-3: *RRCConnectionReconfiguration* in step 3: Additional E-UTRAN TDD-TDD CA interruption at SRS carrier based switching requirement

Derivation Path: 36.508 Table 4.6.1-8, condition SCell_AddMod

Table 7.6.2.4.3-4: *SCellToAddMod-r10-DEFAULT* (in Table 7.6.2.4.3-3)

Derivation Path: 36.508 Table 4.6.3-19D, condition SRS-Switching

Table 7.6.2.4.3-5: *RadioResourceConfigCommonSCell-r10* (in Table 7.6.2.4.3-3)

Derivation Path: 36.508 Table 4.6.3-13A, condition SRS-Switching			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r14 SEQUENCE {			
soundingRS-UL-ConfigCommon-r14 SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc8		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
}			

Table 7.6.2.4.3-6: *PhysicalConfigDedicatedSCell-r10* (in Table 7.6.2.4.3-3)

Derivation Path: 36.508 Table 4.6.3-6A, condition SRS-Switching			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-PeriodicConfigDedicatedList-r14	Not present		
soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE {			
srs-CC-SetIndexList-r14	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r14 CHOICE {			
setup SEQUENCE {			
srs-ConfigIndexAp-r10	47		
srs-ConfigApDCI-Format4-r10	Not present		
srs-ActivateAp-r10 CHOICE {			
srs-ConfigApDCI-Format0-r10 SEQUENCE {			
srs-AntennaPortAp-r10	an1		
srs-BandwidthAp-r10	bw5		
freqDomainPositionAp-r10	0		
transmissionCombAp-r10	0		
cyclicShiftAp-r10	cs0		
}			
srs-ConfigApDCI-Format1a2b2c-r10 SEQUENCE {			
srs-AntennaPortAp-r10	an1		
srs-BandwidthAp-r10	bw5		
freqDomainPositionAp-r10	0		
transmissionCombAp-r10	0		
cyclicShiftAp-r10	cs0		
}			
}			
}			
}			
}			

7.6.2.5 Test requirement

Table 7.6.2.4.1-1 and 7.6.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD CA interruption at SRS carrier based switching.

Table 7.6.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD CA interruption at SRS carrier based switching

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
Special subframe configuration		6		6	
Uplink-downlink configuration		1		1	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz:47-52		5MHz:18-24 10MHz:13-37 20MHz:47-52	
PDSCH parameters: DL Reference Measurement Channel as defined in A.1.2		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel as defined in A.2.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Pattern defined in D.2		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98		-98	
RSRP Note 3	dBm/15 kHz	-82	-82	-82	-82
$\hat{E}_s / I_{ot}$	dB	16	16	16	16
SCH_RP Note 3	dBm/15 kHz	-82	-82	-82	-82
$\hat{E}_s / N_{oc}$	dB	16	16	16	16
Io Note 3	dBm/Ch BW	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)	-54.11+10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
timing offset to cell1	μs	-		0	
Time alignment error relative to cell 1 Note 5	μs	-		≤ TAE	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation

Table 7.6.2.5-2: Sounding Reference Symbol Configuration for E-UTRAN TDD-TDD CA interruption at SRS carrier based switching

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc8	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	47	SRS periodicity of 40ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331.		

The UE shall be continuously scheduled in PCell throughout the test and during the time duration T2, at most 4 ACK/NACK loss on PCell shall be detected.

The rate of correct events observed during repeated tests shall be at least 90%.

8 UE Measurements Procedures

When the UE is in RRC_CONNECTED state on a cell, UE reports measurement information in accordance with the measurement configuration as provided by the System Simulator. To initiate a specific measurement, the System Simulator sends a 'RRC Connection Reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), after that the measurement reporting process takes place. In this process when the reporting criteria are fulfilled the UE sends a 'Measurement Report message' to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a 'Measurement Report message' to the System Simulator is event-triggered as defined in TS 36.331 [5] clause 5.5.3. The measurement reporting succeeds only if the measurement report is sent within the specified measurement reporting delay period.

The reference channels in this section assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

8.1 E-UTRAN FDD intra frequency measurements

8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.1.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.1.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$ is 800 ms.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\_Period,\ Intra}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 8 (cells).

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected. The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.1.

8.1.1.4 Test description

8.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.1.5 Test requirement

Tables 8.1.1.4.1-1 and 8.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells

8.1.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.1.2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$ is 800 ms.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\_Period,\ Intra}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 8 (cells).

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.2.

8.1.2.4 Test description

8.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.2.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.2.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	5	

8.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.2.5-1. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10.Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.2.5 Test requirement

Tables 8.1.2.4.1-1, 8.1.2.5-1, and 8.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.2.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.1.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.1.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as defined in table 8.1.2.2.1.2-1 of TS 36.133 [4] clause 8.1.2.2.1.2.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state with DRX cycles of 80 ms or greater the measurement period for intra frequency measurements is $T_{measure\_intra}$ as defined in table 8.1.2.2.1.2-2 of TS 36.133 [4] clause 8.1.2.2.1.2. The UE shall be capable of performing RSRP and RSRQ measurement for 8 identified intra frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.3.

8.1.3.4 Test description

8.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	dB	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.3.5-2
Time offset between cells		3 µs		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.3.5-1 and 8.1.3.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.3.4.1-1 as appropriate.

8.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.3.5 Test requirement

Tables 8.1.3.4.1-1, 8.1.3.5-1, 8.1.3.5-2 and 8.1.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.3.5-2: DRX Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.3.5-3: TimeAlignmentTimer and sr-ConfigIndex-Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	

TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.4 Void

8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.1.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of intra-frequency SI acquisition in FDD for HO.

8.1.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.3 and A.8.1.5.

8.1.5.4 Test description

8.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.5.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.5.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.5.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.5.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.5.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.5.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.5.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.5.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.5.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.5.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.5.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.5.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.1.5.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.5.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.5.5 Test requirement

Tables 8.1.5.4.1-1 and 8.1.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.1.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,intra} = T_{basic\_identify\_CGI,intra} \quad ms$$

$T_{basic\_identify\_CGI,intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.1.6.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.1.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of intra-frequency SI acquisition in FDD for HO. Applicability requires support for FGI bit 5

8.1.6.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.3 and A.8.1.6.

8.1.6.4 Test description

8.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.6.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.6.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.1.6.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.6.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.6.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.6.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.6.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.6.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.6.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.6.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.6.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.6.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.6.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.6.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.6.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.6.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.6.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.6.5 Test requirement

Tables 8.1.6.4.1-1, 8.1.6.5-1, 8.1.6.5-2 and 8.1.6.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.1.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.6.5-2: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,intra} = T_{basic\_identify\_CGI,intra} \quad ms$$

$T_{basic\_identify\_CGI,intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.7 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

8.1.7.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

8.1.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

8.1.7.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_eICIC,intra} \cdot \frac{T_{Measurement\_Period\_eICIC,Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_eICIC,intra}$ is 1000 ms.

T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_eICIC}$ cells , where $Y_{measurement\_intra\_eICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_eICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_eICIC} = Floor\left\{ X_{basic\_measurement\_FDD\_eICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_eICIC,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_FDD\_eICIC}$ = 8 (cells)

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_eICIC}$ defined above becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_eICIC,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.1 and A.8.1.7.

8.1.7.4 Test description

8.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15.

2. The general test parameter settings are set up according to Table 8.1.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.7.4.3.

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.1.7.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For all cells in the test
A3-Offset	dB	-11	
Event A3 measurement quantity		RSRP	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 !=0	Cell PCIs are selected so that the condition is met
ABS pattern		'10000000100000001000000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1 during T1. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 2 measurements.
Time domain measurement resource restriction pattern for PCell measurements		'01000000010000000100000001000000001000000'	Configured during T1 for Cell 1 measurements

8.1.7.4.2 Test procedure

There are two synchronous E-UTRA cells in the test on the same RF channel. Cell 1 is the Pcell and also the aggressor cell, Cell 2 is the neighbour victim cell to be identified. Non-MBSFN ABS pattern is configured for aggressor cell (Cell 1). The UE is configured with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells (Cell 2). The UE is also configured with a time domain measurement resource restriction pattern for PCell (Cell 1) measurements. It is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2. The information for both measurement patterns shall be provided to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 8.1.7.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.7.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-22 (-11 dB)	-11 is actual value in dB (-22 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.7.4.3-5: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 8.1.7.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00001000000001000000'	BIT STRING (SIZE (40))	Cell1
}			
}			
}			

8.1.7.5 Test requirements

Table 8.1.7.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and in D.1.6 (OP.6 FDD)		OP.5 FDD		OP.6 FDD	
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
$(\hat{E}_s / N_{oc})_{meas}$ Note 5	dB	1	1	-Infinity	-3.2
$(\hat{E}_s / N_{oc})_{ABS}$	dB	1	1	N/A	N/A
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-3.2
SCH $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-6.74
Propagation Condition		ETU30			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSRP is estimated for Cell 1 during the PCell restricted subframes.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_eICIC}$

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E-UTRA\_FDD\_eICIC,intra} \cdot \frac{T_{Measurement\_Period\_eICIC,Intra}}{T_{Intra}} \quad ms$$

$T_{basic\_identify\_E-UTRA\_FDD\_eICIC,\ intra}$ = 1000 ms

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

8.1.8.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

8.1.8.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

8.1.8.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E-UTRA\_FDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E-UTRA\_FDD\_FeICIC,\ intra}$ is 1000 ms.

T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_FeICIC}$ cells , where $Y_{measurement\_intra\_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_FeICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_FeICIC} = Floor\left\{ X_{basic\_measurement\_FDD\_FeICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_FeICIC,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_FDD\_FeICIC}$ = 8 (cells).

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FeICIC}$ defined above becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_FeICIC,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.3 and A.8.1.8.

8.1.8.4 Test description

8.1.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.54.

2. The general test parameter settings are set up according to Table 8.1.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.8.4.3.

5. In this test, there are three E-UTRA cells, Cell 1, Cell 2 and Cell 3, all on same frequencies. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.1.8.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
PCell			Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.
Neighbour cells			Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell 2 is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number			1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	For all cells in the test
A3-Offset		dB	-14	
Event A3 measurement quantity			RSRP	
CP length			Normal	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
T1		S	5	
T2		S	5	
Physical cell IDs			(PCI_{cell1} - PCI_{cell3})mod6 = 0 (PCI_{cell2} - PCI_{cell3})mod6 != 0 PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'10000000100000001000000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2 during T1.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time domain measurement resource restriction pattern for PCell measurements			'01000000010000000100000001000000010000000'	Configured during T1 for Cell 1 measurements
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

8.1.8.4.2 Test procedure

The test parameters are given in Tables 8.1.8.4.1-1 and 8.1.8.51-1. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1 and Cell 2 according to T1 in Table 8.1.8.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 for Cell 1, Cell 2, and Cell 3 as specified in Table 8.1.8.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Formulas are applied until PCI-s values are found, which fulfill the PCI conditions described in Table 8.1.8.4.1-1.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 5.2A.5.1 with the following exceptions:

Table 8.1.8.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 8.1.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-28 (-14 dB)	-14 is actual value in dB (-28 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
maxReportCells	2		
}			

Table 8.1.8.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
physCellId	PhysCellId of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.8.4.3-5: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

Table 8.1.8.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100000001000000001000000'	BIT STRING (SIZE (40))	Cell1
}			
}			
}			

8.1.8.5 Test requirements

Tables 8.1.8.4.1-1 and 8.1.8.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS test.

Table 8.1.8.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		1		1	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and in D.1.6 (OP.6 FDD)		OP.5 FDD		OP.6 FDD		N/A	OP.6 FDD
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1		N/A	0
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$(\hat{E}_s / N_{oc})$	dB	4	4	2	2	-Infinity	-3.20
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$ Note 5	dB	4	2.30	2	0.30	-Infinity	-8.66
SCH $\hat{E}_s / I_{ot}$	dB	-0.12	-0.86	-3.45	-4.01	-Infinity	-10.27
Propagation Condition		ETU30		ETU30		ETU30	

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
NOTE 4: RSRP, SCH_RP, and $\hat{E}_s / I_{ot}$ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_FeICIC}$

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_FeICIC,\ intra}$ is 1000 ms.

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth

8.1.9.1 Test purpose

Same test purpose as defined in clause 8.1.1.1.

8.1.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N.

8.1.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.1.3 with the following exceptions:

- Instead of A.8.1.1 → use A.8.1.9.

8.1.9.4 Test description

8.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.9.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Note 1: See Table 8.1.1.4.1-1 for the other parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

8.1.9.4.2 Test procedure

Same test procedure as defined in clause 8.1.1.4.2 with the following exceptions:

- Instead of Table 8.1.1.5-1 → use Table 8.1.9.5-1.

8.1.9.4.3 Message contents

Same message contents as defined in clause 8.1.1.4.3.

8.1.9.5 Test requirement

Same test requirement as defined in clause 8.1.1.5 with the following exceptions:

Tables 8.1.9.4.1-1 and 8.1.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth test.

Table 8.1.9.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
BWchannel	MHz	5		5	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)		OP.15 FDD		OP.16 FDD	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 8.1.1.5-1 for the other parameters.					

8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth

8.1.10.1 Test purpose

Same test purpose as defined in clause 8.1.3.1.

8.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA bands within band group FDD_N. Applicability requires support for FGI bit 5.

8.1.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.3.3 with the following exceptions:

- Instead of A.8.1.3 → use A.8.1.10.

8.1.10.4 Test description

8.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.10.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for 5MHz bandwidth

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.5 FDD		As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD		As specified in clause A.2.1
Channel Bandwidth (BWchannel)	MHz	5		
NOTE 1: See Table 8.1.3.4.1-1 for the other parameters. NOTE 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.				

8.1.10.4.2 Test procedure

Same test procedure as defined in clause 8.1.3.4.2 with the following exceptions:

- Instead of Table 8.1.3.5-1 → use Table 8.1.10.5-1.

8.1.10.4.3 Message contents

Same message contents as defined in clause 8.1.3.4.3.

8.1.10.5 Test requirement

Same test requirement as defined in clause 8.1.3.5 with the following exceptions:

Tables 8.1.10.4.1-1, 8.1.10.5-1, 8.1.3.5-2 and 8.1.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for 5MHz bandwidth test.

Table 8.1.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
$BW_{channel}$	MHz	5		5	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD		OP.16 FDD	
NOTE: See Table 8.1.3.5-1 for the other parameters.					

8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0

8.1.11.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.11.2 Test applicability

This test applies to all type of E-UTRA FD-FDD UE release 12 and forward of UE Category 0.

8.1.11.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

- $T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms
- T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform

measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\,cat\,0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\,cat\,0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\,cat\,0,\,Intra}} \right\}$$

cells where

- $X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells)
- $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.11.

8.1.11.4 Test description

8.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.11.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.11.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.11.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.1.11.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.11.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.11.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.11.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.11.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.11.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.11.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.11.5 Test requirement

Tables 8.1.11.4.1-1 and 8.1.11.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.11.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	6.10	--0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\ \_\ FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.11_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis

8.1.11_2.1 Test purpose

To verify the category 1bis UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.11_2.2 Test applicability

This test applies to all type of E-UTRA FD-FDD UE release 13 and forward of UE Category 1bis.

8.1.11_2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

- $T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms
- T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.5 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

- $X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells)
- $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.5.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.7, 9.1.2.8 and 9.1.5.5, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.11.

8.1.11_2.4 Test description

8.1.11_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.11_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.11_2.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.11_2.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-10	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.1.11_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.11_2.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.11_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.11_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.11_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.11_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-20 (-10 dB)	-10 is actual value in dB (-20 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.11_2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.11_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.11_2.5 Test requirement

Tables 8.1.11_2.4.1-1 and 8.1.11_2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.11_2.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	7.9	-0.60	-Infinity	-2.15
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	7.9	7.9	-Infinity	6.40
RSRP Note 4	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
SCH_RP Note 4	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\ intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

8.1.12.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.12.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.12.

8.1.12.4 Test description

8.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.12.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.12.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.12.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.12.5-2
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.12.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.12.5-1. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.12.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.12.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.12.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.12.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.12.5 Test requirement

Tables 8.1.12.4.1-1, 8.1.12.5-1 and 8.1.12.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.12.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.96
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.12.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\ \_\ FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.12_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis

8.1.12_2.1 Test purpose

To verify the category 1bis UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.12_2.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

8.1.12_2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\ \_\ FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.5 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\,cat\,0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\,cat\,0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\,cat\,0,\,Intra}} \right\}$$

cells where

$X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.7 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.5.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.7, 9.1.2.8 and 9.1.5.5, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.12.

8.1.12_2.4 Test description

8.1.12_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.12_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.12_2.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.12_2.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-10	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.12_2.5-2
Time offset between cells		3 µs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.12_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.12_2.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.12_2.5-1. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.12_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.12_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.12_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-20 (-10 dB)	-10 is actual value in dB (-20 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.12_2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.12_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.12_2.5 Test requirement

Tables 8.1.12_2.4.1-1, 8.1.12_2.5-1 and 8.1.12_2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.12_2.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	7.90	0.60	-Infinity	-2.15
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	7.90	7.90	-Infinity	6.40
RSRP Note 4	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
SCH_RP Note 4	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.12_2.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\ \_\ FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

8.1.13.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.13.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.13.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13.3-1.

Table 8.1.13.3-1: Requirement to identify a newly detectable FDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	[1] (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.13.3-2: Requirement to measure FDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.2 and A.8.1.13

8.1.13.4 Test description

8.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.13.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.13.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.13.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.13 FDD		As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in clause A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.13.5-2
Time offset between cells		3 µs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.13.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.13.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 start.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.13.5-1 and 8.1.13.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.13.4.1-1 as appropriate.

8.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.13.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.13.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.13.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.13.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.13.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.13.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.13.5 Test requirement

Tables 8.1.13.4.1-1, 8.1.13.5-1, 8.1.13.5-2 and 8.1.13.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.13.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 3	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 3	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.13.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.13.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.13_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis

8.1.13_2.1 Test purpose

To verify the category 1bis UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.13_2.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

8.1.13_2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13_2.3-1.

Table 8.1.13_2.3-1: Requirement to identify a newly detectable FDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	[1] (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.5 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13_2.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.13_2.3-2: Requirement to measure FDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.5.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.2.7, 9.1.2.8 and 9.1.5.5, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.2 and A.8.1.13.

8.1.13_2.4 Test description

8.1.13_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.13_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.13_2.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.13_2.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.14 FDD		As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD		As specified in clause A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-10		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.13_2.5-2
Time offset between cells		3 μs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.13_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.13_2.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 start.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.13_2.5-1 and 8.1.13_2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the

UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.13_2.4.1-1 as appropriate.

8.1.13_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.13_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.13_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.13_2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-20 (-10 dB)	-10 is actual value in dB (-20 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.13_2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.13_2.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.13_2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.13_2.5 Test requirement

Tables 8.1.13_2.4.1-1, 8.1.13_2.5-1, 8.1.13_2.5-2 and 8.1.13_2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.13_2.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	7.90	0.60	-Infinity	-2.15
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	7.90	7.90	-Infinity	6.40
RSRP Note 3	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
SCH_RP Note 3	dBm/15 KHz	-90.1	-90.1	-Infinity	-91.6
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.13_2.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.13_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.14.1 Test purpose

To verify the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements.

8.1.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.14.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\ \_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.1 and A.8.1.14.

8.1.14.4 Test description

8.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.14.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.14.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.1.14.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..
2. Set the parameters according to T1 in Table 8.1.14.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.14.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   -switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.14.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.14.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.14.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.14.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.14.5 Test requirement

Table 8.1.14.4.1-1 and 8.1.14.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table 8.1.14.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.15.1 Test purpose

To verify the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements.

8.1.15.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.15.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_UE\,cat\ 0} = Floor\left\{ X_{basic\_measurement\_FDD\_UE\,cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ FDD\_UE\ cat\ 0}$ = 8 (cells);

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.1 and A.8.1.15.

8.1.15.4 Test description

8.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 (using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.1.15.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.15.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.15.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.15.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..

2. Set the parameters according to T1 in Table 8.1.15.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.15.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
-switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.15.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.15.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.15.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.15.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.15.5 Test requirement

Table 8.1.15.4.1-1 and 8.1.15.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.15.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\ \_\ FDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\ \_\ Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.16.1 Test purpose

To verify the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements.

8.1.16.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO of UE category 0.

8.1.16.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in table 8.1.16.3-1.

Table 8.1.16.3-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	1 (Note1)
0.04<DRX-cycle≤0.08	Note2 (50)
0.128	3.2 (32)
0.128<DRX-cycle≤2.56	Note2(25)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in table 8.1.16.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.16.3-2: Requirement to measure HD-FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	0.4 (Note1)
0.04<DRX-cycle≤0.16	Note2 (7)
0.16<DRX-cycle≤2.56	Note2(5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.2 and A.8.1.16.

8.1.16.4 Test description

8.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.16.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.16.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.16.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.16.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.16.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.16.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.16.4.1-1 as appropriate.

8.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.16.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.16.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.16.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.16.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.16.4.3-5: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.16.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.16.5 Test requirement

Table 8.1.16.4.1-1 and A.8.1.16.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.16.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

8.1.17.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra-frequency cell search requirements.

8.1.17.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.17.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\_TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E-UTRA\_TDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ ,intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\ measurement\ TDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ TDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\ intra\_UE\ cat\ 0}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.1 and A.8.1.17.

8.1.17.4 Test description

8.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.17.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.17.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.17.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.17.5-2
Time offset between cells		3 µs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.17.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.17.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.17.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.17.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.17.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.17.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.17.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.17.5 Test requirement

Tables 8.1.17.4.1-1, 8.1.17.5-1 and 8.1.17.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.17.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s / I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 4	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s / N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.17.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\ \_\ TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\ \_\ Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.17_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis

8.1.17_2.1 Test purpose

To verify the category 1bis UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra-frequency cell search requirements.

8.1.17_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

8.1.17_2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\ \_\ TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\ \_\ Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.5 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ ,intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ \ intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\ measurement\ TDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ TDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\ intra\_UE\ cat\ 0}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.5.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.7, 9.1.2.8 and 9.1.5.5, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.1 and A.8.2.12.

8.1.17_2.4 Test description

8.1.17_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.17_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.17_2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.17_2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.17_2.5-2
Time offset between cells		3 µs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.17_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.17_2.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.17_2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.17_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.17_2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.17_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-20 (-10 dB)	-10 is actual value in dB (-20 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.17_2.4_1.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.17_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.17_2.5 Test requirement

Tables 8.1.17_2.4.1-1, 8.1.17_2.5-1 and 8.1.17_2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.17_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-90.1	-90.1	-Infinity	-91.6
$\hat{E}_s / I_{ot}$	dB	7.90	0.60	-Infinity	-2.15
SCH_RP Note 4	dBm/15 kHz	-90.1	-90.1	-Infinity	-91.6
$\hat{E}_s / N_{oc}$	dB	7.90	7.90	-Infinity	6.40
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.17_2.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\ \_\ TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\ \_\ Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

8.1.18.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.1.18.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.18.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18.3-1.

Table 8.1.18.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	1 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clause 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.18.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.2 and A.8.1.18

8.1.18.4 Test description

8.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.18.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.18.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.18.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.12 TDD		As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in clause A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.18.5-2
Time offset between cells		3 μs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.18.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.18.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.18.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.18.4.1-1 as appropriate.

8.1.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.18.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.18.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.1.18.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.18.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.1.18.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.18.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.18.5 Test requirement

Tables 8.1.18.4.1-1, 8.1.18.5-1, 8.1.18.5-2 and 8.1.18.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.18.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s / I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 3	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s / N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.18.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.18.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.18_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis

8.1.18_2.1 Test purpose

To verify the category 1bis UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.1.18_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 5.

8.1.18_2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18_2.3-1.

Table 8.1.18_2.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	1 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clause 9.1.2.7 and 9.1.2.8 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.5 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18_2.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.18_2.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.7 and 9.1.2.8, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.5.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.2.7, 9.1.2.8 and 9.1.5.5, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.2 and A.8.2.13.

8.1.18_2.4 Test description

8.1.18_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.18_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.18_2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.18_2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.13 TDD		As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD		As specified in clause A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-10		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.18_2.5-2
Time offset between cells		3 µs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.18_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.18_2.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.18_2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.18_2.4.1-1 as appropriate.

8.1.18_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.18_2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.18_2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.1.18_2.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-20 (-10 dB)	-10 is actual value in dB (-20 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.18_2.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.1.18_2.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.18_2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.18_2.5 Test requirement

Tables 8.1.18_2.4.1-1, 8.1.18_2.5-1, 8.1.18_2.5-2 and 8.1.18_2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.18_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-90.1	-90.1	-Infinity	-91.6
$\hat{E}_s / I_{ot}$	dB	7.90	0.60	-Infinity	-2.15
SCH_RP Note 3	dBm/15 kHz	-90.1	-90.1	-Infinity	-91.6
$\hat{E}_s / N_{oc}$	dB	7.90	7.90	-Infinity	6.40
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.18_2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.18_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.1.19.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 0.

8.1.19.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward with support of intra-frequency SI acquisition in FDD for HO of UE category 0.

8.1.19.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.19.

8.1.19.4 Test description

8.1.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.19.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.19.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.19.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.15 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.19.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.19.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.19.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210ms at least 112 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 210 ms, and the UE have more than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.19.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.19.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.19.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.19.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.19.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.19.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.19.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.19.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.19.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.19.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2
}			

Table 8.1.19.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.19.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.19.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.19.5 Test requirement

Tables 8.1.19.4.1-1 and 8.1.19.5-1 define the primary level settings including test tolerances for E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 test.

Table 8.1.19.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined inD.1.10 (OP.10 FDD) and in D.1.2(OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 207 ms, allow 210 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 112 ACK/NACK number is caused by two parts. Firstly, at least 92 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.5.2.1.4. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell.

8.1.19_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis

8.1.19_2.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 1bis.

8.1.19_2.2 Test applicability

This test applies to all type of E-UTRA FD-FDD UE release 13 and forward of UE Category 1bis.

8.1.19_2.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.19.

8.1.19_2.4 Test description

8.1.19_2.4.1 Initial conditions

Same as 8.1.19.4 with following exception

Use Table 8.1.19_2.4.1-1 instead of Table 8.1.19.4-1.

Table 8.1.19_2.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.15 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.19_2.5 Test requirement

TBD

Tables 8.1.19_2.4.1-1 and 8.1.19_2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis test.

Table 8.1.19_2.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined inD.1.10 (OP.10 FDD) and in D.1.2(OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,intra} = T_{basic\_identify\_CGI,intra} \quad ms$$

$T_{basic\_identify\_CGI,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 207 ms, allow 210 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 112 ACK/NACK number is caused by two parts. Firstly, at least 92 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.5.2.1.4. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell.

8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.1.20.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX for UE category 0.

8.1.20.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward with support of intra-frequency SI acquisition in FDD for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.1.20.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,

- only one code word is transmitted in each subframe,

-no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.20.

8.1.20.4 Test description

8.1.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1 Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.1.20.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.20.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.20.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.20.5-2
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.20.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing

information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.20.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.20.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.20.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.20.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.20.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.20.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.20.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.20.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.20.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.20.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.20.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.20.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.20.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.20.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.20.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.20.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.20.5 Test requirement

Tables 8.1.20.4.1-1, 8.1.20.5-1, 8.1.20.5-2 and 8.1.20.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 test.

Table 8.1.20.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.20.5-2: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.20.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 207 ms, allow 210 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.20_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

8.1.20_2.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 1bis.

8.1.20_2.2 Test applicability

This test applies to all type of E-UTRA FD-FDD UE release 13 and forward of UE Category 1bis.

8.1.20_2.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.20.

8.1.20_2.4 Test description

8.1.20_2.4.1 Initial conditions

Same as 8.1.20.4 with following exception

Use Table 8.1.20_2.4.1-1 instead of Table 8.1.20.4-1.

Table 8.1.20_2.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.20_2.5-2
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.20_2.5 Test requirement

Tables 8.1.20_2.4.1-1, 8.1.20_2.5-1, 8.1.20_2.5-2 and 8.1.20_2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis test.

Table 8.1.20_2.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.20_2.5-2: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.20_2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 207 ms, allow 210 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.1.21.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 0.

8.1.21.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition in FDD for HO of UE category 0.

8.1.21.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.5 and A.8.1.21.

8.1.21.4 Test description

8.1.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.21.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.21.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.21.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.2 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.4 HD-FDD	As specified in clause A.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.21.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.21.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.21.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210ms at least 112 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 210 ms, and the UE have more than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.21.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.21.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.21.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.21.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.21.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.21.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.21.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.21.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.21.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.21.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2
}			

Table 8.1.21.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.21.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.21.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.21.5 Test requirement

Tables 8.1.21.4.1-1 and 8.1.21.5-1 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 test.

Table 8.1.21.5-1: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,intra} = T_{basic\_identify\_CGI,intra} \quad ms$$

$T_{basic\_identify\_CGI,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 207 ms, allow 210 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.1.22.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX for UE category 0.

8.1.22.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition in FDD for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.1.22.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.5 and A.8.1.22.

8.1.22.4 Test description

8.1.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.22.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.22.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.22.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.2 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.4 HD-FDD	As specified in clause A.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.6.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.22.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.22.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.22.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.22.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.22.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.22.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.22.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
...			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.22.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.22.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.22.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.22.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.22.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.22.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.22.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.22.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.22.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.22.5 Test requirement

Tables 8.1.22.4.1-1, 8.1.22.5-1, 8.1.22.5-2 and 8.1.22.5-3 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 test.

Table 8.1.22.5-1: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.1(OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.22.5-2: DRX configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.22.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 207 ms, allow 210 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UEin CEModeA

8.1.23.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements for CE UE.

8.1.23.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.23.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.23.3-1 when SCH Ês/Iot >= -6 dB.

Table 8.1.23.3-1: Requirement on cell identification delay and measurement delay for FDD intra frequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table I.2.x-1[TBD] for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.23.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.23.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.23.3 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.13.2.1.1.1 and A.8.1.23.

8.1.23.4 Test description

8.1.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.23.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.23.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.23.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.23.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.23.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.23.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 2882 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.23.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.23.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.23.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.23.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.23.5 Test requirement

Tables 8.1.23.4.1-1 and 8.1.23.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.23.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus TT ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

8.1.24.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements for CE UE.

8.1.24.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.24.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.23.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.1 and A.8.1.24.

8.1.24.4 Test description

8.1.24.4.1 Initial conditions

Same initial conditions as in clause 8.1.23.4.1 with following exceptions:

- Instead of Table 8.1.23.4.1-1 → use Table 8.1.24.4.1-1.

Table 8.1.24.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.24.4.2 Test procedure

Same test procedure as in clause 8.1.23.4.2 with following exceptions:

- Instead of Table 8.1.23.5-1 → use Table 8.1.23.5-1.

8.1.24.4.3 Message contents

Same message contents as in clause 8.1.23.4.3.

8.1.24.5 Test requirement

Tables 8.1.24.4.1-1 and 8.1.24.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.24.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.33 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.24.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Comment	
	Value	
onDurationTimer	psf20	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UEin CEModeA in DRX

8.1.25.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements in DRX for CE UE.

8.1.25.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

8.1.25.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.25.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.25.3-2.

Table 8.1.25.3-1: Requirement to identify a newly detectable FDD intra frequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	<0.128	2.88 (Note1)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.		

Table 8.1.25.3-2: Requirement to identify a newly detectable FDD intra frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table I.2.x-1[TBD] for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.25.3-3. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.25.3-4. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.25.3-3: Requirement to measure FDD intra frequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.128	0.48 (Note1)
	0.128≤DRX-cycle≤2.56	Note2 (5)
1	<0.256	0.96 (Note1)
	0.256≤DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.		

Table 8.1.25.3-4: Requirement to measure FDD intra frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ M1}$ defined in Clause 8.1.25.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in clause 8.1.25.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.2 and A.8.1.25.

8.1.25.4 Test description

8.1.25.4.1 Initial conditions

Same initial conditions as in clause 8.1.23.4.1 with following exceptions:

- Instead of Table 8.1.23.4.1-1 → use Table 8.1.25.4.1-1.

Table 8.1.25.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE when DRX is used

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1	1	One radio channel is used.
Active cell			Cell 1	Cell 1	
Neighbour cell			Cell 2	Cell 2	Cell to be identified.
CP length			Normal	Normal	
DRX			ON	ON	DRX related parameters are defined in Table 8.1.25.5-2
A3	Offset	dB	-6	-6	
	Hysteresis	dB	0	0	
	Time To Trigger	s	0	0	
Filter coefficient			0	0	L3 filtering is not used
Gap pattern ID			0	0	
T1		s	5	5	
T2		s	5	30	

8.1.25.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.1.25.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.25.5-1 and 8.1.25.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1482 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

11. Repeat steps 1-10 for each sub-test Table 8.1.25.4.1-1 as appropriate.

8.1.25.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.25.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-2a Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3 Table H.7.1-1

Table 8.1.25.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.25.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.25.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.25.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.25.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.25.5 Test requirement

Tables 8.1.25.4.1-1, 8.1.25.5-1, 8.1.25.5-2, and 8.1.25.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX.

Table 8.1.25.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.33 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.7	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.25.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.25.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1482 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 TT ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.26 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA

8.1.26.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for CE UE.

8.1.26.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.26.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.26.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.26.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.26.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.26.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.26.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has

not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.13.2.1.2.1 and A.8.1.26.

8.1.26.4 Test description

8.1.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.26.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.26.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.26.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.26.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.26.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.26.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 2882 ms then the number of successful tests is increased by

one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.26.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.26.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.26.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.26.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.26.5 Test requirement

Tables 8.1.26.4.1-1 and 8.1.26.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table 8.1.26.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.25 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1} = 2880$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.27 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

8.1.27.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for CE UE.

8.1.27.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.27.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.27.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.27.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.27.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.27.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.27.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.2.1 and A.8.1.27.

8.1.27.4 Test description

8.1.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.27.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.27.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.27.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	As specified in TS 36.133 [4] clause 8.1.2.1
T1		S	5	
T2		S	5	

8.1.27.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.1.27.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.27.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 2882 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.27.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7Table H.7.1-1

Table 8.1.27.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.27.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.27.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.27.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_L

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_L
Setup SEQUENCE {			
onDurationTimer	psf20		
drx-InactivityTimer	psf1920		
drx-RetransmissionTimer	psf16		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
}			

8.1.27.5 Test requirement

Tables 8.1.27.4.1-1 and 8.1.27.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.27.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.25 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.42	Specified in Cell 1 columns	
Correlation Matrix and Propagation Condition		ETU30		ETU30	
Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.27.5-2: DRX-Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Comment	
	Value	
onDurationTimer	psf20	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.28 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA in DRX

8.1.28.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements in DRX for CE UE.

8.1.28.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.28.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable HD-FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.28.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable HD-FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.28.3-2.

Table 8.1.28.3-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	≤0.08	2.88 (Note1)
	0.128	3.2 (32)
	0.128<DRX-cycle≤2.56	Note2(25)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.28.3-2: Requirement to identify a newly detectable HD-FDD intrafrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (25)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.28.3-3. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.28.3-4. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.28.3-3: Requirement to measure HD-FDD intrafrequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.08	0.48 (Note1)
	0.08≤DRX-cycle≤0.16	Note2 (7)
	0.16<DRX-cycle≤2.56	Note2(5)
1	<0.16	0.96 (Note1)
	DRX-cycle=0.16	1.12 (7)
	0.16<DRX-cycle≤2.56	Note2(5)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.28.3-4: Requirement to measure HD-FDD intrafrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use	

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ M1}$ defined in Clause 8.1.28.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in clause 8.1.28.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.2 and A.8.1.28.

8.1.28.4 Test description

8.1.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.28.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.28.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.28.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE when DRX is used

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1	1	One radio channel is used.
Active cell			Cell 1	Cell 1	
Neighbour cell			Cell 2	Cell 2	Cell to be identified.
CP length			Normal	Normal	
DRX			ON	ON	DRX related parameters are defined in Table 8.1.28.5-2
A3	Offset	dB	-6	-6	
	Hysteresis	dB	0	0	
	Time To Trigger	s	0	0	
Filter coefficient			0	0	L3 filtering is not used
Gap pattern ID			0	0	As specified in TS 36.133 [4] clause 8.1.2.1.
T1		s	5	5	
T2		s	5	35	

8.1.28.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.28.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.28.5-1 and 8.1.28.5-2.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1482 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.
11. Repeat steps 1-10 for each sub-test Table 8.1.28.4.1-1 as appropriate.

8.1.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.28.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-2a Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3 Table H.7.1-1

Table 8.1.28.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.28.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	30		
dsr-TransMax	n4		
}			
}			

Table 8.1.28.4.3-5: *MeasResults*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.28.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.28.5 Test requirement

Tables 8.1.28.4.1-1, 8.1.28.5-1, 8.1.28.5-2, and 8.1.28.5-3 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CE in DRX.

Table 8.1.28.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R. 25 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s / I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.34	Specified in Cell 1 columns	
Correlation Matrix and Propagation Condition		ETU30		ETU30	
Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.28.5-2: DRX-Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.28.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for CE UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	30	30	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1482 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

8.1.29.1 Test purpose

To verify that the Cat-M1 UE in CEModeA to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements.

8.1.29.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE.

8.1.29.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ M1}$ in RRC_CONNECTED state.

When no DRX is in use, the UE shall be able to identify and measure a new detectable TDD intra frequency cell according to requirements in Table 8.1.29.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.29.3-1: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.29.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.21.1 and 9.1.21.2.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra_UE cat M1 defined in TS 36.133 [4] clause 8.13.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra_UE cat M1 provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.3.1 and A.8.1.29.

8.1.29.4 Test description

8.1.29.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.29.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.29.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.29.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter		Unit	Value	Comments
E-UTRA RF Channel Number			1	One radio channel is used for this test.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Filter coefficient			0	L3 filtering is not used
Gap Pattern Id			1	
T1		s	5	
T2		s	5	

8.1.29.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. MPDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with condition CEMode A according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.29.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.29.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 2882 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEMode A according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEMode A according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEMode A and the following exceptions:

Table 8.1.29.4.3-1: Common Exception messages for E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.1.29.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.29.4.3-3: MeasResults: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.29.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.29.5 Test requirement

Tables 8.1.29.4.1-1 and 8.1.29.5-1 define the primary level settings including test tolerances for E-UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.29.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.7.3		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel as specified in clause A.8.3		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.60	-Infinity	-1.26
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9 MHz	-64.76	-62.34	-64.76	-62.34
Propagation Condition		ETU 30		ETU 30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Time offset to Cell 1	µs	-		3	

Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA in DRX

8.1.30.1 Test purpose

To verify that the Cat-M1 UE in CEModeA to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements in DRX requirements.

8.1.30.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support for FGI bit 5.

8.1.30.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_UE\ catM1}$ as shown in table 8.1.30.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in table 8.1.30.3-1A.

Table 8.1.30.3-1: Requirement to identify a newly detectable TDD intrafrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	<0.128	2.88 (Note1)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.30.3-1A: Requirement to identify a newly detectable TDD intrafrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14-1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in table 8.1.30.3-2. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in table 8.1.30.3-2A. The UE shall be capable of performing RSRP measurements for 6 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.30.3-2: Requirement to measure TDD intra frequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.128	0.48 (Note1)
	0.128≤DRX-cycle≤2.56	Note2 (5)
1	<0.256	0.96 (Note1)
	0.256≤DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.30.3-2A: Requirement to measure TDD intra frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.21.1 and 9.1.21.2.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.3.2 and A.8.1.30.

8.1.30.4 Test description

8.1.30.4.1 Initial conditions

Same initial conditions as in clause 8.1.29.4.1 with following exceptions:

- Instead of Table 8.1.19.4.1-1 → use Table 8.1.30.4.1-1.

Table 8.1.30.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used

Parameter		Unit	Value		Comments
			Test 1	Test 2	
E-UTRA RF Channel Number			1		One radio channel is used for both tests.
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		DRX related parameters are defined in Table 8.1.30.5-2
A3	Offset	dB	-6		
	Hysteresis	dB	0		
	Time To Trigger	s	0		
Special subframe configuration			6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Filter coefficient			0		L3 filtering is not used
Gap Pattern Id			0		
T1		s	5		
T2		s	5	30	

8.1.30.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.1.30.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.30.5-1 and 8.1.30.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1482 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging

fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
or
- switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

11. Repeat steps 1-10 for each sub-test Table 8.1.30.4.1-1 as appropriate.

8.1.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.30.4.3-1: Common Exception messages for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.7.1-1

Table 8.1.30.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.1.30.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.30.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.1.30.4.3-5: MeasResults: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.30.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.30.5 Test requirement

Tables 8.1.30.4.1-1, 8.1.30.5-1, 8.1.30.5-2 and 8.1.30.5-3 define the primary level settings including test tolerances for E-UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.30.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.7.3		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel as specified in clause A.8.3		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.60	-Infinity	-1.26
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9 MHz	-64.76	-62.34	-64.76	-62.34
Propagation Condition		ETU 30		ETU 30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Time offset to Cell 1	µs	-		3	

Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.30.5-2: DRX-Configuration for E-UTRAN TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.30.5-3: *TimeAlignmentTimer-Configuration* for E-UTRAN TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1482 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.31 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

8.1.31.1 Test purpose

To verify the Cat-M1 UE in CEModeB to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.31.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEMode B.

8.1.31.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.31.3-1 provided that additional conditions Table 8.1.31.3-1 is met.

Table 8.1.31.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Neighouring cell SCH Ês/Iot: Q2	Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤ Q2 < -6	0	320.8 s	800 ms
	1	321.6 s	1600ms
Q2≥-6	0	21.8	800 ms
	1	22.6	1600ms

Table 8.1.31.3-2: Void

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.101 [4] Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.101 [4] Annex Table B.2.14-3 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.31.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.101 [4] sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in TS 36.101 [4] Clause 8.13.3.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS 36.101 [4] clause 8.13.3.1.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.1.1 and A.8.1.31.

8.1.31.4 Test description

8.1.31.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.31.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.31.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.31.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.31.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.31.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.31.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 320802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6), without waiting for T2 to expire the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.31.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.31.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.31.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.31.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.31.5 Test requirement

Tables 8.1.31.4.1-1 and 8.1.31.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.31.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.4		R.23 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.4		R.19 FDD		R.19 FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	-11.20	-10.80	-Infinity	-10.80
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.20	-11.15	-Infinity	-11.15
RSRP Note 3	dBm/15 KHz	-109.20	-108.80	-Infinity	-108.80
SCH_RP Note 3	dBm/15 KHz	-109.20	-108.80	-Infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 320800 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 320802 ms in this test case (note: this gives a total of 320800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.32 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

8.1.32.1 Test purpose

To verify the Cat-M1 UE in CEModeB to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.32.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 13 and forward of UE category M1 and higher, including non-BL/CE UE. Applicability requires support CEMode B.

8.1.32.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.31.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.1.1 and A.8.1.32.

8.1.32.4 Test description

8.1.32.4.1 Initial conditions

Same initial conditions as in clause 8.1.31.4.1 with following exceptions:

- Instead of Table 8.1.31.4.1-1 → use Table 8.1.32.4.1-1.

Table 8.1.32.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.32.4.2 Test procedure

Same test procedure as in clause 8.1.31.4.2 with following exceptions:

- Instead of Table 8.1.31.5-1 → use Table 8.1.32.5-1.

8.1.32.4.3 Message contents

Same message contents as in clause 8.1.31.4.3.

8.1.32.5 Test requirement

Tables 8.1.32.4.1-1 and 8.1.32.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.32.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.4		R.23 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.4		R.19 FDD		R.19 FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98 + TT			
$\hat{E}_s / N_{oc}$	dB	-11.20	-10.80	-Infinity	-10.80
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.20	-11.15	-Infinity	-11.15
RSRP Note 3	dBm/15 KHz	-109.20	-108.80	-Infinity	-108.80
SCH_RP Note 3	dBm/15 KHz	-109.20	-108.80	-Infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Correlation Matrix and Propagation Condition		ETU30		ETU30	
Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 320800 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 320802 ms in this test case (note: this gives a total of 320800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

8.1.33.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for CE UE.

8.1.33.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE, that support CE Mode B.

8.1.33.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.33.3-1 provided that additional conditions table 8.1.33.3-2 is met.

Table 8.1.33.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.33.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for FDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.33.3-1	As defined in table 8.1.33.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-4 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.33.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.33.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.33.3 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.2.1 and A.8.1.33.

8.1.33.4 Test description

8.1.33.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.33.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.33.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.33.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used for this test
Active Cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.33.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.33.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.33.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.33.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.33.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.33.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.33.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.33.5 Test requirement

Tables 8.1.33.4.1-1 and 8.1.33.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table A.8.1.33.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD		R.9 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 3208

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

8.1.34.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for CE UE.

8.1.34.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE, that support CE Mode B.

8.1.34.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.34.3-1 provided that additional conditions table 8.1.34.3-2 is met.

Table 8.1.34.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.34.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for FDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.34.3-1	As defined in table 8.1.34.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-4 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.34.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.34.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.34.3 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.2.1 and A.8.1.34.

8.1.34.4 Test description

8.1.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.34.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.34.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.34.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used for this test
Active Cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.34.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.34.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.34.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.34.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.34.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.34.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.34.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.34.5 Test requirement

Tables 8.1.34.4.1-1 and 8.1.34.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table A.8.1.34.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD		R.9 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 KHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 KHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1} = 3208$

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

8.1.35.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements for CE UE.

8.1.35.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 and higher, including non-BL/CE UE that support CE Mode B.

8.1.35.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable TDD intra frequency cell according to requirements in Table 8.1.35.3-1provided that additional conditions Table 8.1.35.3-2 is met.

Table 8.1.35.3-1: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.35.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for TDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.35.3-1	As defined in table 8.1.35.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-3 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.35.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6

cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.35.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.35.3 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.3.1 and A.8.1.35.

8.1.35.4 Test description

8.1.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.35.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.35.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.35.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter		Unit	Value	Comments
E-UTRA RF Channel Number			1	One radio channel is used for this test.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Filter coefficient			0	L3 filtering is not used
Gap Pattern Id			0	
T1		s	5	
T2		s	≤325	

8.1.35.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.35.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.35.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.35.4.3-1: Common Exception messages for E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.7.1-1

Table 8.1.35.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.35.4.3-3: *MeasResults*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.35.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.35.5 Test requirement

Tables 8.1.35.4.1-1 and 8.1.35.5-1 define the primary level settings including test tolerances for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.35.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.19 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 TDD		R.17 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s / I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 3208

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.36 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances, Test system uncertainties and test requirement values
- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.

8.1.36.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for CE UE in CEModeB.

8.1.36.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward with supports CEModeB and intra-frequency SI acquisition for HO.

8.1.36.3 Minimum conformance requirements

The requirements defined in TS 36.133 [4] subclause 8.13.3.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\ M1,\ intra} = T_{basic\_identify\_CGI\_Cat\ M1,\ intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\ M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\ M1,intra}$ *ms* , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.1.36.3-1.

Table 8.1.36.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$.

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.4 and A.8.1.36.

8.1.36.4 Test description

8.1.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.36.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.36.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.36.4.1-1: General test parameters for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.36.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.36.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.36.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.36.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.1.36.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.36.4.3-3: *MeasResults*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.36.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.36.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.36.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.36.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.36.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.36.4.3-9: *MeasResults*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1. 36.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.36.5 Test requirement

Tables 8.1.36.4.1-1 and 8.1.36.5-1 define the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.1.36.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Channel in clause A.8.4		R.23 FDD			N/A		
MPDCCH Reference Channel in clause A.7.4		R.19 FDD			N/A		
OCNG Patterns defined in D.1 (OP.21 FDD) and (OP.6 FDD)		OP.21 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$		8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition level					20		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5137 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\ M1,\ intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.1.37 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances, Test system uncertainties and test requirement values
- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.

8.1.37.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX for CE UE in CEModeB.

8.1.37.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward with supports CEModeB, DRX and intra-frequency SI acquisition for HO.

8.1.37.3 Minimum conformance requirements

The requirements defined in TS 36.133 [4] subclause 8.13.3.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\,M1,\,intra} = T_{basic\_identify\_CGI\_Cat\,M1,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\,M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\,M1,\,intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.1.37.3-1.

Table 8.1.37.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.4 and A.8.1.37.

8.1.37.4 Test description

8.1.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.37.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.37.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.37.4.1-1: General test parameters for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.37.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on NPUSCH.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.1.37.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.37.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.37.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.1.37.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.37.4.3-3: *MeasResults*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.37.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.37.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.37.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.37.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.37.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.37.4.3-9: *MeasResults*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.37.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

Table 8.1.37.4.3-11: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.37.4.3-12: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.37.4.3-13: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

8.1.37.5 Test requirement

Tables 8.1.37.4.1-1 and 8.1.37.5-1 define the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.1.37.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Channel in clause A.8.4		R.23 FDD			N/A		
MPDCCH Reference Channel in clause A.7.4		R.19 FDD			N/A		
OCNG Patterns defined in D.1 (OP.21 FDD) and (OP.6 FDD)		OP.21 FDD			OP.6 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$		8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition level					20		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.37.5-2: DRX configuration for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.37.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CeModeB

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5120 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\ M1,\ intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.1.38 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.
- Test tolerances, Test system uncertainties and test requirement values

8.1.38.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for CE UE in CEModeB.

8.1.38.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward with supports CEModeB and intra-frequency SI acquisition for HO.

8.1.38.3 Minimum conformance requirements

The requirements defined in TS 36.133[4] subclause 8.13.3.1.5 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1-BR are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\ M1,\ intra} = T_{basic\_identify\_CGI\_Cat\ M1,\ intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\ M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\ M1,intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.1.38.3-1.

Table 8.1.38.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$.

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.5 and A.8.1.38.

8.1.38.4 Test description

8.1.38.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 8.1.38.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.38.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.38.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.38.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.38.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.38.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.38.4.3-1: Common Exception messages for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.1.38.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.38.4.3-3: *MeasResults*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.38.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.38.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.38.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.38.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.38.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.38.4.3-9: *MeasResults*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.38.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.38.5 Test requirement

Tables 8.1.38.4.1-1 and 8.1.38.5-1 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.1.38.5-1: Cell Specific Test requirement Parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel in clause A.8.4		R.13 HD-FDD			N/A		
MPDCCH Reference Channel in clause A.7.4		R.9 HD-FDD			N/A		
OCNG Patterns defined in D.1 (OP.21 FDD) and (OP.2 FDD)		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2		-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity+TT	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$	dB	8+TT	6.24+TT	6.24+TT	-Infinity+TT	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition					Configured as specified in TS 36.211 [16]		
SIB1-BR repetition level					16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5137 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\,M1,\,intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.1.39 E-UTRAN HD-FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.
- Test tolerances, Test system uncertainties and test requirement values

8.1.39.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX for CE UE in CEModeB.

8.1.39.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward with supports CEModeB, DRX and intra-frequency SI acquisition for HO.

8.1.39.3 Minimum conformance requirements

The requirements defined in TS 36.133 [4] subclause 8.13.3.1.5 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\,M1,\,intra} = T_{basic\_identify\_CGI\_Cat\,M1,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\,M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\,M1,\,intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.1.39.3-1.

Table 8.1.39.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.5 and A.8.1.39.

8.1.39.4 Test description

8.1.39.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.39.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.39.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.39.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.39.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on NPUSCH.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.1.39.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.39.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.39.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.39.4.3-1: Common Exception messages for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.1.39.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.39.4.3-3: *MeasResults*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.39.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.39.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.39.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.39.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.39.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.39.4.3-9: *MeasResults*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.39.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

Table 8.1.39.4.3-11: *MAC-MainConfig-RBC*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.39.4.3-12: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.39.4.3-13: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

8.1.39.5 Test requirement

Tables 8.1.39.4.1-1 and 8.1.39.5-1 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.1.39.5-1: Cell Specific Test requirement Parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Channel as specified in clause A.8.4		DL Reference Measurement Channel R.13 HD-FDD			N/A		
MPDCCH Reference Channel as specified in clause A.7.4		DL Reference Measurement Channel R.9 HD-FDD			N/A		
OCNG Patterns defined in D.1. (OP.21 FDD) and (OP.6 FDD)		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$	dB	8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition		-			Configured as specified in TS 36.211 [16]		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.39.5-2: DRX configuration for E-UTRAN HD-FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.39.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CeModeB

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5120 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\ M1,\ intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.1.40 E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells

8.1.40.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when UE is configured with *highSpeedEnhancedMeasFlag* within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.40.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 14 and forward which supports *highSpeedEnhancedMeasFlag.* Applicability requires support for FGI bit 5.

8.1.40.3 Minimum conformance requirements

When *highSpeedEnhancedMeasFlag* is configured the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as defined in table 8.1.2.2.1.2-1B of TS 36.133 [4] clause 8.1.2.2.1.2.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Section 9.1.17.2.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

When *highSpeedEnhancedMeasFlag* is configured in the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as defined in table 8.1.2.2.1.2-4 of TS 36.133 [4] clause 8.1.2.2.1.2. . The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of Tmeasure_intra.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH where TTIDCCH is the duration of subframe or slot or subslot when the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1.2 and A.8.1.40.

8.1.40.4 Test description

8.1.40.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.1.40.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.40.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.40.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting with DRX for UE configured with highSpeedEnhancedMeasFlag

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.40.1-3
T1	s	5	
T2	s	30	

8.1.40.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. At the same time, highSpeedEnhancedMeasFlag is broadcasted to UE. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.40.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.40.5-1 and 8.1.40.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 12800 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.1.40.4.1-1 as appropriate.

8.1.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.40.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Default Message Contents	
Common contents of system information blocks on condition of highSpeedConfig-r14 exceptions	
Default RRC messages and information elements contents on condition of highSpeedConfig-r14 with exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.40.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.40.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.40.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.40.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.40.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.40.5 Test requirement

Tables 8.1.40.4.1-1, 8.1.40.5-1, 8.1.40.5-2 and 8.1.40.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.1.40.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting with DRX for UE configured with highSpeedEnhancedMeasFlag

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	
PDSCH parameters		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		-	
OCNG Patterns defined in A.3.2.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4.7	4.7	-Infinity	4.7
$\hat{E}_s / I_{ot}$	dB	4.7	-1.27	-Infinity	-1.27
RSRP Note 3	dBm/15 KHz	-93.3	-93.3	-Infinity	-93.3
SCH_RP Note 3	dBm/15 KHz	-93.3	-93.3	-Infinity	-93.3
Io Note 3	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-62.42 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 1	
Propagation Condition		AWGN		AWGN 1750Hz Note 4	
Antenna Configuration		2x2		2x2	
Timing offset to Cell 1 Synchronous cells	us	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The AWGN 1750Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1750Hz.

Table 8.1.40.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting with DRX for UE configured with *highSpeedEnhancedMeasFlag*

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.40.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting with DRX for UE configured with *highSpeedEnhancedMeasFlag*

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 12800 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.41 E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap

8.1.41.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event for serving cell without using any measurement gaps within the E-UTRA FD-FDD intra-frequency cell measurement requirements.

8.1.41.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.1.41.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

Same minimum conformance requirements as in clause 8.1.23.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1 and A.8.1.41.

8.1.41.4 Test description

8.1.41.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.41.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.41.4.3.
5. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.41.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	
Active cell			Cell 1	
CP length			Normal	
DRX			OFF	
A2	Threshold	dB	-96	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Rmax			8	As defined in *mPDCCH-NumRepetition* in [3]
G			1	As defined in *mPDCCH-startSF-UESS* in [3]
T1		S	5	
T2		S	5	

8.1.41.4.2 Test procedure

The test consists of one active cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A2 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the beginning of T2 the transmission power of cell 1 is decreased, and this shall result in reporting of Event A2.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA
2. Set the parameters according to T1 in Table 8.1.41.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.41.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A2. If the overall delays measured from the beginning of time period T2 is less than 480 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.41.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.41.4.3-1: Common Exception messages for E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.1.41.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A2		
reportConfig[1]	ReportConfig-A2		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A2		
}			
}			

Table 8.1.41.4.3-3: *ReportConfig-A2*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-115)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
}			

Table 8.1.41.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.1.41.4.3-5: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

8.1.41.5 Test requirement

Table 8.1.41.4.1-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.1.41.5-1: Cell specific test parameters for E-UTRAN FD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD	
OCNG Patterns		OP.21 FDD	
PBCH_RA	dB	-3	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-104	-104
$\hat{E}_s / N_{oc}$	dB	19.6	-3
$\hat{E}_s / I_{ot}$ Note 3	dB	19.6	-3
RSRP Note 3	dBm/15 KHz	-84.4	-107
SCH_RP Note 3	dBm/15 KHz	-84.4	-107
Io Note 3	dBm/9MHz	-56.57	-74.45
Propagation Condition		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A2 triggered measurement report. The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The UE shall send one Event A2 triggered measurement report, with a measurement reporting delay less than 480ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, if the reporting criteria are not fulfilled.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.42 E-UTRAN HD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap

8.1.42.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event for serving cell without using any measurement gaps within the E-UTRA HD-FDD intra-frequency cell measurement requirements.

8.1.42.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.1.42.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

Same minimum conformance requirements as in clause 8.1.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.2 and A.8.1.42.

8.1.42.4 Test description

8.1.42.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.23.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.41.4.3.
5. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.42.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	
Active cell			Cell 1	
CP length			Normal	
DRX			OFF	
A2	Threshold	dB	-96	
	Hysteresis	dB	0	
	Time To Trigger	S	0	

Filter coefficient		0	L3 filtering is not used
Rmax		8	As defined in *mPDCCH-NumRepetition* in [3]
G		1	As defined in *mPDCCH-startSF-UESS* in [3]
T1	S	5	
T2	S	5	

8.1.42.4.2 Test procedure

Same test procedure as in clause 8.1.41.4.2.

8.1.42.4.3 Message contents

Same as in clause 8.1.41.4.3.

8.1.42.5 Test requirement

Table 8.1.42.4.1-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.1.42.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter	Unit	Cell 1	
		T1	T2

E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel		R.11 HD-FDD	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD	
PBCH_RA	dB	-3	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-104	-104
$\hat{E}_s / N_{oc}$	dB	19.6	-3
$\hat{E}_s / I_{ot}$ Note 3	dB	19.6	-3
RSRP Note 3	dBm/15 KHz	-84.4	-107
SCH_RP Note 3	dBm/15 KHz	-84.4	-107
Io Note 3	dBm/9MHz	-56.57	-74.45
Propagation Condition		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A2 triggered measurement report. The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The UE shall send one Event A2 triggered measurement report, with a measurement reporting delay less than 480ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, if the reporting criteria are not fulfilled.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2 E-UTRAN TDD intra frequency measurements

8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.2.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra frequency cell search requirements.

8.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.2.1.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD,\ intra}$ is 800 ms

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Section 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\_Period,\ Intra}} \right\} \text{cells}$$

where

$X_{basic\ measurement\ TDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2.1 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2 and A.8.1.2.

8.2.1.4 Test description

8.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.2.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.1.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.1.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.2.1.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	5	

8.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.1.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.2.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.1.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.1.5 Test requirement

Tables 8.2.1.4.1-1, 8.2.1.5-1, and 8.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.2.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s / I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s / N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.2.1.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_TDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.2.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.2.2.3 Minimum conformance requirements

Note: The state when no DRX is used is assumed to be the one in which the DRX Inactivity Timer is running, and the state when DRX is used is assumed to be otherwise for this performance requirement.

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra}$ as shown in table 8.2.2.3-1

Table 8.2.2.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.08<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Section 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state with DRX cycles of 80ms or greater the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in table 8.2.2.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for TS 45.008 [15] identified-intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.2.2.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04<DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2 and A.8.2.2.

8.2.2.4 Test description

8.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.2.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.2.2.4-2
Time offset between cells	µs	3		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.2.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.2.2.4.1-1 as appropriate.

8.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.2.2.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.2.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.2.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.2.5 Test requirement

Tables 8.2.2.5-1, 8.2.2.5-2 and 8.2.2.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.2.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 3	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.2.2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf40	sf1280	
shortDRX	disable	disable	

Table 8.2.2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.3 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.2.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in TS 36.133 [4] section 8.1.2.2.4.

8.2.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of intra-frequency SI acquisition in TDD for HO.

8.2.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.3.3-1 during the identification of a new CGI of E-UTRA cell.

Table 8.2.3.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI,\ intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	18
1	35
2	43
3	36
4	39
5	42
6	30

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.4 and A.8.2.3.

8.2.3.4 Test description

8.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.2.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.3.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.3.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.2.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose reportCGI and si-RequestForHO set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 47 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 47 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by

one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 47 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.3.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.3.4.3-3: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.3.4.3-5: ReportConfigEUTRA-PERIODICAL: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.3.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.3.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step 7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.3.4.3-9: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.3.5 Test requirement

Tables 8.2.3.4.1-1 and 8.2.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.33	-3.33	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 47 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 47 ACK/NACK number is caused by two parts. Firstly, at least 35 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.2.3.3-1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.2.4 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.2.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of intra-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5

8.2.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.4 and A.8.2.4.

8.2.4.4 Test description

8.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.2.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.4.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.4.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.2.4.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.2.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.4.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.4.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.4.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.2.4.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.4.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
...			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.4.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.4.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.4.4.3-7: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.4.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.4.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.4.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.4.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.4.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.4.4.3-13: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.4.5 Test requirement

Tables 8.2.4.4.1-1, 8.2.4.5-1, 8.2.4.5-2 and 8.2.4.5-3 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.33	-3.33	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.2.4.5-2: DRX configuration for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.4.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.5 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

8.2.5.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

8.2.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

8.2.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable TDD intra-frequency cell within

$$T_{identify\_\,intra\_eICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC,\,intra} \cdot \frac{T_{Measurement\_Period\_eICIC,\,Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC,\,intra}$ is 1000 ms.

T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells , including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_eICIC}$ cells , where $Y_{measurement\_intra\_eICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_eICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_eICIC} = Floor\left\{ X_{basic\_measurement\_TDD\_eICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_eICIC,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_TDD\_eICIC}$ = 8 (cells)

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_eICIC}$ defined above becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_eICIC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.2 and A.8.2.5.

8.2.5.4 Test description

8.2.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15.

2. The general test parameter settings are set up according to Table 8.2.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.5.4.3.

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.2.5.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-11	
Event A3 measurement quantity		RSRP	
CP length		Normal	
Special subframe configuration		6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs are selected so that the condition is met
ABS pattern		'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1 during T1. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 2 measurements.
Time domain measurement resource restriction pattern for PCell measurements		'10000000001000000000'	Configured during T1 for Cell 1 measurements

8.2.5.4.2 Test procedure

There are two synchronous E-UTRA cells in the test on the same RF channel. Cell 1 is the Pcell and also the aggressor cell, Cell 2 is the neighbour victim cell to be identified. Non-MBSFN ABS pattern is configured for aggressor cell (Cell 1). The UE is configured with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells (Cell 2). The UE is also configured with a time domain measurement resource restriction pattern for PCell (Cell 1) measurements. It is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2. The information for both measurement patterns shall be provided to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 8.2.5.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.5.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.5.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.5.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-22 (-11 dB)	-11 is actual value in dB (-22 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.5.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.5.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.2.5.4.3-5: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	Cell1
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 8.2.5.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

8.2.5.5 Test requirements

Table 8.2.5.5-1: Cell specific test requirement parameters for E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
$(\hat{E}_s / N_{oc})_{meas}$ Note 5	dB	1	1	-Infinity	-3.2
$(\hat{E}_s / N_{oc})_{ABS}$	dB	1	1	N/A	N/A
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-6.74
SCH $\hat{E}_s / I_{ot}$	dB	1	0.7	-Infinity	-3.2
Propagation Condition		ETU30			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSPP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSPP is estimated for Cell 1 during the PCell restricted subframes.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_eICIC}$

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E-UTRA\_TDD\_eICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_eICIC,\ Intra}}{T_{Intra}} \quad ms$$

$T_{basic\_identify\_E-UTRA\_TDD\_eICIC,\ intra}$ = 1000 ms

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

8.2.6.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

8.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

8.2.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E-UTRA\_TDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

- $T_{basic\_identify\_E-UTRA\_TDD\_eICIC,\ intra}$ is 1000 ms.
- T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when:

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_FeICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified

intra-frequency cells , including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_FeICIC}$ cells , where $Y_{measurement\_intra\_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_FeICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_FeICIC} = Floor\left\{ X_{basic\_measurement\_TDD\_FeICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_FeICIC,\ Intra}} \right\} \text{ cells}$$

where

- $X_{basic\_measurement\_TDD\_FeICIC}$ = 8 (cells)
- $T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FeICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FeICIC}$ defined above becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_FeICIC,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.4 and A.8.2.6.

8.2.6.4 Test description

8.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.54.
2. The general test parameter settings are set up according to Table 8.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.6.4.3.
5. In this test, there are three E-UTRA cells, Cell 1, Cell 2 and Cell 3, all on same frequencies. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.2.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
PCell			Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.
Neighbour cells			Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell 2 is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number			1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	For all cells in the test
A3-Offset		dB	-14	
Event A3 measurement quantity			RSRP	
CP length			Normal	
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
T1		s	5	
T2		s	5	
Physical cell IDs			(PCI_{cell1} - PCI_{cell3})mod6 = 0 (PCI_{cell2} - PCI_{cell3})mod6 != 0 PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			‘00000000010000000001’	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 during T1.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			‘00000000010000000001’	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time domain measurement resource restriction pattern for PCell measurements			‘10000000001000000000’	Configured during T1 for Cell 1 measurements
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig
	antennaPortsCount		1	

	mbsfn-SubframeConfigList		*oneFrame* = '000000'	element with subframe allocation *one Frame*='000000'.

8.2.6.4.2 Test procedure

The test parameters are given in Tables 8.2.6.4.1-1 and 8.2.6.51-1. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1 and Cell 2 according to T1 in Table 8.2.6.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 for Cell 1, Cell 2, and Cell 3 as specified in Table 8.2.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Formulas are applied until PCI-s values are found, which fulfill the PCI conditions described in Table 8.2.6.4.1-1.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 5.2A.5.1 with the following exceptions:

Table 8.2.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 8.2.6.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-28 (-14 dB)	-14 is actual value in dB (-28 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
maxReportCells	2		
}			

Table 8.2.6.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.6.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
physCellId	PhysCellId of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.6.4.3-5: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	Cell1
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

Table 8.2.6.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

8.2.6.5 Test requirements

Tables 8.2.6.4.1-1 and 8.2.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS test.

Table 8.2.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		1		1	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2.TDD		N/A	OP.2 TDD
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		N/A	0
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$(\hat{E}_s / N_{oc})$	dB	4	4	2	2	-Infinity	-3.20
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$ Note 5	dB	4	2.30	2	0.30	-Infinity	-8.66
SCH $\hat{E}_s / I_{ot}$	dB	-0.12	-0.86	-3.45	-4.01	-Infinity	-10.27
Propagation Condition		ETU30		ETU30		ETU30	

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
NOTE 4: RSRP, SCH_RP, and $\hat{E}_s / I_{ot}$ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_FeICIC}$

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_FeICIC,\ intra}$ is 1000 ms.

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.2.7.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward with support of intra-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.2.7.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\ intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ *ms*, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.7.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.7.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI\_LC\text{-}UE,intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0 (Note 1)	30
1	54
2	68
3	56
4	61
5	66
6	46
Note 1: The applicability of this requirement is TBD.	

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.7.

8.2.7.4 Test description

8.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.2.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.7.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.7.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.2.7.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.7.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.7.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.7.4.3-3: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.7.4.3-5: ReportConfigEUTRA-PERIODICAL: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.7.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.7.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.7.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step 7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.7.4.3-9: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.7.5 Test requirement

Table 8.2.7.4.1-1 and A.8.2.7.5.1-1 define the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps.

Table 8.2.7.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 190 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\,intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 190 ms at least 66 ACK/NACK shall be detected as being transmitted by the UE.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The overall 66 ACK/NACK number is caused by two parts. Firstly, at least 54 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.1.2.2.4.1-1 of Clause 8.1.2.2.4.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier o

8.2.7_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis

8.2.7_2.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.7_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward with support of intra-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5 of UE category 1bis.

8.2.7_2.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.2.7 and 9.1.2.8 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to 36.331 [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.7_2.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.7_2.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	30
1	54
2	68
3	56
4	61
5	66
6	46

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.7.

8.2.7_2.4 Test description

8.2.7_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.2.7_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.7_2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.7_2.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5 in TS 36.133
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2 in TS 36.133
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.2.7_2.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.7_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.7_2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.7_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.7_2.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.7_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.7_2.4.3-3: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.7_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.7_2.4.3-5: ReportConfigEUTRA-PERIODICAL: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.7_2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.7_2.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.7_2.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step 7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.7_2.4.3-9: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.7_2.5 Test requirement

Table 8.2.7_2.4.1-1 and 8.2.7_2.5.1-1 define the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps.

Table 8.2.7_2.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 190 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\,intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 190 ms at least 66 ACK/NACK shall be detected as being transmitted by the UE.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.2.8.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward with support of intra-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.2.8.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.8.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.8.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI\_LC-UE, intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0 (Note 1)	30
1	54
2	68
3	56
4	61
5	66
6	46
Note 1: The applicability of this requirement is TBD.	

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.8.

8.2.8.4 Test description

8.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.2.8.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.8.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.8.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.8.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.2.8.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.8.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.8.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.8.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.2.8.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.8.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.8.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.8.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.8.4.3-7: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.8.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.8.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.8.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.8.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.8.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.8.4.3-13: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.8.5 Test requirement

Tables 8.2.8.4.1-1, 8.2.8.5-1, 8.2.8.5-2 and 8.2.8.5-3 define the primary level settings including test tolerances for Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX.

Table 8.2.8.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36+	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.2.8.5.1-2: DRX configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.8.5.1-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Intra frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\,intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2.8_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis

8.2.8_2.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.8_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward with support of intra-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5 of UE category 1bis.

8.2.8_2.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.2.7 and 9.1.2.8 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex I.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to 36.331 [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC\text{-}UE,\,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.8_2.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,

- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.8_2.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	30
1	54
2	68
3	56
4	61
5	66
6	46

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.8.

8.2.8_2.4 Test description

8.2.8_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.2.8_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.8_2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.8_2.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5 in TS 36.133
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2 in TS 36.133
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.8.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.2.8_2.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.8_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.8_2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.8_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.8_2.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.8_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.2.8_2.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.8_2.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.8_2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.8_2.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.8_2.4.3-7: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.8_2.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.8_2.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.8_2.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.8_2.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.8_2.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.8_2.4.3-13: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.8_2.5 Test requirement

Tables 8.2.8_2.4.1-1, 8.2.8_2.5-1, 8.2.8_2.5-2 and 8.2.8_2.5-3 define the primary level settings including test tolerances for Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX.

Table 8.2.8_2.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.2.8_2.5.1-2: DRX configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.8_2.5.1-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Intra frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\,intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2.9 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.
- Test tolerances, Test system uncertainties and test requirement values

8.2.9.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for CE UE in CEModeB.

8.2.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward with supports CEModeB and intra-frequency SI acquisition for HO.

8.2.9.3 Minimum conformance requirements

The requirements defined in TS 36.133 [4] subclause 8.13.3.1.6 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1-BR are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\,M1,\,intra} = T_{basic\_identify\_CGI\_Cat\,M1,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\ M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\ M1,intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.2.9.3-1.

Table 8.2.9.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$.

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.6 and A.8.2.9.

8.2.9.4 Test description

8.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 8.2.9.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.9.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.9.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤325	
T3	S	7	

8.2.9.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.2.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.9.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.9.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.2.9.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.9.4.3-3: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.9.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.9.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.9.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.9.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.2.9.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.9.4.3-9: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.38.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.2.9.5 Test requirement

Tables 8.2.9.4.1-1 and 8.2.9.5-1 define the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.2.9.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH reference measurement channel as specified in clause A.3.1.4.6		DL Reference Measurement Channel R.19 TDD			N/A		
MPDDCH reference channel as specified in clause A.3.1.3.6		DL Reference Measurement Channel R.16 TDD			N/A		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.11 TDD	OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity+TT	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$	dB	8+TT	6.24+TT	6.24+TT	-Infinity+TT	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	µs	-			3		
PBCH repetition		-			Configured as specified in TS 36.211 [16]		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5137 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\,M1,\,intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2.10 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- The parameter "A3-Offset" value of -16 needs to be updated in core specification since it is out of the signalling range.
- Test tolerances, Test system uncertainties and test requirement values

8.2.10.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX for CE UE in CEModeB.

8.2.10.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward with supports CEModeB, DRX and intra-frequency SI acquisition for HO.

8.2.10.3 Minimum conformance requirements

The requirements defined in TS 36.133 [4] subclause 8.13.3.1.6 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\,M1,\,intra} = T_{basic\_identify\_CGI\_Cat\,M1,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = 5120 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\,M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\,M1,\,intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.2.10.3-1.

Table 8.2.10.3-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.6 and A.8.2.10.

8.2.10.4 Test description

8.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.2.10.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.10.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.10.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.8.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤325	
T3	s	7	

8.2.10.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on NPUSCH.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.2.10.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.10.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. After the SS receives the MeasurementReport message in step 6), without waiting for T2 to expire SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 5137 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 5137 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.10.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.7.1-1

Table 8.2.10.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-32 (-16 dB)	-16 is actual value in dB (-32 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.10.4.3-3: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.10.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.10.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.10.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.10.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.2.10.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.10.4.3-9: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.10.4.3-10: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

Table 8.2.10.4.3-11: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.10.4.3-12: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.10.4.3-13: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

8.2.10.5 Test requirement

Tables 8.2.10.4.1-1 and 8.2.10.5-1 define the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for CE UE in CEModeB test.

Table 8.2.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH reference channel as specified in clause A.3.1.4.6		R.19 TDD			N/A		
MPDCCH reference channel as specified in clause A.3.1.3.6		R.16 TDD			N/A		
OCNG Patterns defined in A.3.2.2.11 (OP.11 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.11 TDD	OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s / N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity+TT	-3+TT	-3+TT
$\hat{E}_s / I_{ot}$	dB	8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Antenna Configuration		2x1			2x1		
Propagation Condition		AWGN					
Timing offset to Cell 1	µs	-			3		
PBCH repetition		-			Configured as specified in TS 36.211 [16]		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.2.10.5-2: DRX configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CEModeB

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.10.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for CE UE in CeModeB

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5120 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\ M1,\ intra}$ + reporting delay

= 15 + 5120 + 2ms from the start of T3

= 5137 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2.11 E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells

8.2.11.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX under high speed scenario when UE is configured with *highSpeedEnhancedMeasFlag*. The tests will partly verify the TDD-TDD intra-frequency cell search in DRX requirements for UE configured with *highSpeedEnhancedMeasFlag*.

8.2.11.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 14 and forward which is configured with *highSpeedEnhancedMeasFlag*. Applicability requires support for FGI bit 5.

8.2.11.3 Minimum conformance requirements

NOTE: The state when no DRX is used is assumed to be the one in which the DRX Inactivity Timer is running, and the state when DRX is used is assumed to be otherwise for this performance requirement.

When DRX is in use the UE configured with *highSpeedEnhancedMeasFlag* shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra}$ as shown in table 8.2.11.3-1.

Table 8.2.11.3-1: Requirement to identify a newly detectable TDD intrafrequency cell for UE configured with *highSpeedEnhancedMeasFlag*

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04<DRX-cycle≤0.08	Note2(15)
0.08<DRX-cycle≤1.28	Note2(10)
1.28<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Section 9.1.5.1 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state with DRX cycles of 1280ms the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in table 8.2.11.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for TS 45.008 [15] identified-intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.2.11.3-2: Requirement to measure TDD intrafrequency cells for UE configured with *highSpeedEnhancedMeasFlag*

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04<DRX-cycle≤0.08	Note2 (4)
0.08<DRX-cycle≤1.28	Note2 (3)
1.28<DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2.2 and A.8.2.11.

8.2.11.4 Test description

8.2.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.2.11.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.1.
4. Message contents are defined in clause 8.2.11.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.11.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.2.11.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	30	

8.2.11.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.11.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.11.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 12800 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.2.11.4.1-1 as appropriate.

8.2.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.11.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Default Message Contents	
Common contents of system information blocks on condition of highSpeedConfig-r14 exceptions	
Default RRC messages and information elements contents on condition of highSpeedConfig-r14 with exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.11.4.3-2: RRCConnectionReconfiguration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.2.11.4.3-3: ReportConfigEUTRA-A3 for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.11.4.3-4: SchedulingRequest-Config-DEFAULT for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.11.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.11.4.3-6: MeasResultListEUTRA: Additional for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.11.5 Test requirement

Tables 8.2.11.5-1, 8.2.11.5-2 and 8.2.11.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.2.11.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100	
PDSCH parameters:		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-	
PCFICH/PDCCH/PHICH parameters:		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		-	
OCNG Pattern defined in A.3.2.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.10 TDD 10MHz:OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	44.9	44.9	-Infinity	44.9
$\hat{E}_s / I_{ot}$	dB	44.9	-1.22	-Infinity	-1.22
RSRP Note 3	dBm/15 kHz	-93.1	-93.1	-Infinity	-93.1
SCH_RP Note 3	dBm/15 kHz	-93.1	-93.1	-Infinity	-93.1
Io Note 3	dBm/Ch BW	-64.10 +10log ($N_{RB,c}$ /50)	-62.466 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 1	
Propagation Condition		AWGN		AWGN 1750Hz Note 4	
Antenna Configuration		2x2		2x2	
Timing offset to Cell 1 Synchronous cells	us	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The AWGN 1750Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1750Hz.

Table 8.2.11.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [2]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.11.5-3: *TimeAlignmentTimer* -Configuration E-UTRAN TDD-TDD intra-frequency event triggered reporting under high speed conditions in synchronous cells when DRX is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331 [2]
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 [2] and clause 10.1 in TS 36.213 [3].

When DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 12800 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 10 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 14082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.12

8.2.13

8.2.14 E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE in CEModeA without gap

8.2.14.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event for serving cell without using any measurement gaps within the E-UTRA TDD intra-frequency cell measurement requirements.

8.2.14.2 Test applicability

This test applies to all types of E-UTRA TDD CE UE, including both BL/CE and non-BL/CE UE.

8.2.14.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

When no DRX is in use, the UE shall be able to identify and measure a new detectable TDD intra frequency cell according to requirements in Table 8.2.14.3-1 when SCH Ês/Iot >= -6 dB, provided

- G=1, or
- r_{max}*G < 80ms, or
- UE is receiving PDSCH.

Otherwise, requirements in Table 8.2.14.3-3 apply, where r_{max} and G are given by higher layer parameter *mPDCCH-NumRepetition* and *mPDCCH-startSF-UESS* respectively as defined in TS 36.213.

Table 8.2.14.3-1: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	480 * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	2.88 * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	960 * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms

$K_{intra\_M1\_NC}$ = 100 / X where X is signalled by the RRC parameter *measGapSharingScheme* [2] and is defined as in Table 8.13.2.1.3.1-2 when *highSpeedMeasGapCE-ModeA* [2] is not configured, and in Table 8.2.14.3-2A when *highSpeedMeasGapCE-ModeA* [2] is configured. N_{freq} is total number of inter-frequency layers to be monitored as defined in 8.1.2.1.1. When inter frequency measurement is not configured, $K_{intra\_M1\_NC}$=1 regardless whether or how parameter measGapSharingScheme [2] is configured.

Table 8.2.14.3-2: Value of parameter X for CEModeA

measGapSharingScheme	Value of X (%)
'00'	$\frac{100}{N_{freq}+1}$
'01'	40
'10'	50
'11'	60

Table 8.2.14.3-2A: Value of parameter X for CEModeA for UE configured with *highSpeedMeasGapCE-ModeA*

measGapSharingScheme	Value of X (%)
'00'	$[\frac{100}{N_{freq}+1}]$
'01'	[50]
'10'	[80]
'11'	[90]

Table 8.2.14.3-3: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell with MPDCCH scaling

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	Max(20 * r_{max}*G / 1000, 1.44) * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 480) * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	Max(20 * r_{max}*G / 1000, 2.88) * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 960) * $K_{intra\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms

$$K_{RSTD\_M1\_NC} = \frac{1}{1 - \max(\frac{40}{T_{PRS}}, \frac{N_{PRS}}{T_{PRS}})}$$

$K_{RSTD\_M1\_NC}$ is applicable provided following conditions are met:

- $T_{PRS} > 40$ ms
- $T_{PRS} > N_{PRS}$
- PRS bandwidth is less than the bandwidth of the cell used for RSTD measurement in which case gaps are required

where

- T_{PRS} is the cell-specific positioning subframe configuration period as defined in TS 36.211,
- N_{PRS} is the number of consecutive downlink positioning subframes in a positioning location defined in TS 36.211

Otherwise $K_{RSTD\_M1\_NC} = 1$.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.21.6 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex Table B.2.14-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.13.2.1.3.1-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least

6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.21.1 and 9.1.21.2.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1, 9.1.21.2 and 9.1.21.6.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ M1\_NC}$ defined in Clause 8.13.2.1.2.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1\_NC}$ defined in clause 8.13.2.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1\_NC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.3 and A.8.2.14.

8.2.14.4 Test description

8.2.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.2.14.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.41.4.3.
5. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.14.4.1-1: Initial conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	
Active cell			Cell 1	
CP length			Normal	
DRX			OFF	
A2	Threshold	dB	-96	
	Hysteresis	dB	0	
	Time To Trigger	S	0	

Filter coefficient		0	L3 filtering is not used
Rmax		8	As defined in *mPDCCH-NumRepetition* in [3]
G		1	As defined in *mPDCCH-startSF-UESS* in [3]
T1	S	5	
T2	S	5	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells

8.2.14.4.2 Test procedure

The test consists of one active cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A2 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the beginning of T2 the transmission power of cell 1 is decreased, and this shall result in reporting of Event A2.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA

2. Set the parameters according to T1 in Table 8.2.14.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.14.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A2. If the overall delays measured from the beginning of time period T2 is less than 480 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.2.14.4.3-1: Common Exception messages for E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.2.14.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A2		
reportConfig[1]	ReportConfig-A2		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A2		
}			
}			

Table 8.2.14.4.3-3: *ReportConfig-A2*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-115)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
}			

Table 8.2.14.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.2.14.4.3-5: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

8.2.14.5 Test requirement

Table 8.2.14.4.1-1 define the primary level settings including test tolerances for E-UTRAN TDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.2.14.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter	Unit	Cell 1	
		T1	T2

E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel		R.17 TDD	
MPDCCH parameters: DL Reference Measurement Channel		R.15 TDD	
OCNG Patterns		OP.11 TDD	
PBCH_RA	dB	-3	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 KHz	-104	-104
$\hat{E}_s / N_{oc}$	dB	19.6	-3
$\hat{E}_s / I_{ot}$ Note 3	dB	19.6	-3
RSRP Note 3	dBm/15 KHz	-84.4	-107
SCH_RP Note 3	dBm/15 KHz	-84.4	-107
Io Note 3	dBm/9MHz	-56.57	-74.45
Propagation Condition		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A2 triggered measurement report. The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The UE shall send one Event A2 triggered measurement report, with a measurement reporting delay less than 480ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, if the reporting criteria are not fulfilled.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3 E-UTRAN FDD-FDD Inter-frequency Measurements

8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.3.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.3.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.1.3-1.

Table 8.3.1.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.1.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has

not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.1.

8.3.1.4 Test description

8.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.1.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.1.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.3.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.1.5 Test requirement

Tables 8.3.1.4.1-1 and 8.3.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.1.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.1_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis

8.3.1_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward. Applicability requires support for FGI bit 25 of UE category 1bis.

8.3.1_2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.3 and 9.1.3.4 and RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively, with measurement period given by table 8.3.1_2.3-1.

Table 8.3.1_2.3-1: Measurement period and measurement bandwidth (category 1bis UE)

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	960 x N_{freq}	6
1 (Note)	480 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.1_2.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.1.

8.3.1_2.4 Test description

8.3.1_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.3.1_2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.1_2.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.1_2.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.3.1_2.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.1_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.1_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.1_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.1_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.1_2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.1_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.1_2.5 Test requirement

Tables 8.3.1_2.4.1-1 and 8.3.1_2.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.1_2.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x1 Low		1x1 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	8.70
SCH_RP	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.3.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.3.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.3.2.3-1:

Table 8.3.2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.2.3-2.

Table 8.3.2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in TS 36.133 [4] clause 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.2.

8.3.2.4 Test description

8.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.2.4.3.

5. There are two E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1, 2		Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.3.2.5-2
Time offset between cells		3 ms		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	5	30	

8.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.3.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.2.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.3.2.5 Test requirement

Tables 8.3.2.4.1-1, 8.3.2.5-1, 8.3.2.5-2 and 8.3.2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.3.2.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.3.2.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.3.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.3.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.2_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells for UE category 1bis

8.3.2_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.3.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward. Applicability requires support for FGI bits 5, and 25 of UE category 1bis.

8.3.2_2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.3.2_2.3-1:

Table 8.3.2_2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms

≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.3 and 9.1.3.4 and RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.2_2.3-2.

Table 8.3.2_2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.3 and 9.1.3.4, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.5 and 9.1.6.6.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in TS 36.133 [4] clause 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.2.

8.3.2_2.4 Test description

8.3.2_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.3.2_2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.2_2.4.3.

5. There are two E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.2_2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1, 2		Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.3.2_2.5-2
Time offset between cells		3 ms		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	5	30	

8.3.2_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.2_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.2_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2_2.4.1-1 as appropriate.

8.3.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.2_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.3.2_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.2_2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.2_2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.2_2.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.2_2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.2_2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.3.2_2.5 Test requirement

Tables 8.3.2_2.4.1-1, 8.3.2_2.5-1, 8.3.2_2.5-2 and 8.3.2_2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.3.2_2.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x1 Low		1x1 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	8.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.2_2.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.3.2_2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.3.2_2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

8.3.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.3.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD inter frequency cell within $T_{identify\ inter}$ as defined in table 8.1.2.3.1.2-1 of TS 36.133 [4] clause 8.1.2.3.1.2.

A cell shall be considered detectable when

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side condition given in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.3.3.3-1.

Table 8.3.3.3-1: Requirement to measure FDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.1.1 in 3GPP TS 36.133 [4] are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.3.

8.3.3.4 Test description

8.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	dB	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.3.3.5-2
Time offset between cells		3 ms	Asynchronous cells
T1	s	30	
T2	s	9	

8.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.3.5-1 and 8.3.3.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of “successes” is increased by one, otherwise count a fail.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the

UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

12. Repeat step 1-11 for each sub-test in Table 8.3.3.4.1-1 as appropriate.

8.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.3.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.3.4.3-5: *MeaResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.3.4.3-7: *FilterCoefficient*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

Table 8.3.3.4.3-8: *MeasObjectEUTRA-GENERIC(Freq)*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighCellConfig	'10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cells)		
offsetFreq	-14 (dB-14)	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

8.3.3.5 Test requirement

Tables 8.3.3.4.1-1, 8.3.3.5-1, 8.3.3.5-2 and 8.3.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.3.3.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4.00	0.00	4.00	24.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s / N_{oc}$	dB	4.00	0.00	4.00	24.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.3.3.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.3_2 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used for UE category 1bis

8.3.3_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.3.3_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward. Applicability requires support for FGI bits 5, and 25 of UE category 1bis.

8.3.3_2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD inter frequency cell within $T_{identify\ inter}$ as defined in table 8.1.2.3.1.2-1 of TS 36.133 [4] clause 8.1.2.3.1.2.

A cell shall be considered detectable when

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] clauses 9.1.3.3 and 9.1.3.4 and RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.3.3_2.3-1.

Table 8.3.3_2.3-1: Requirement to measure FDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.1.1 in 3GPP TS 36.133 [4] are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.3 and 9.1.3.4, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.5 and 9.1.6.6.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.3.

8.3.3_2.4 Test description

8.3.3_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.3.3_2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.3_2.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.3_2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	dB	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.3.3_2.5-2
Time offset between cells		3 ms	Asynchronous cells
T1	s	30	
T2	s	9	

8.3.3_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.3_2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.3_2.5-1 and 8.3.3_2.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of “successes” is increased by one, otherwise count a fail.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

12. Repeat step 1-11 for each sub-test in Table 8.3.3_2.4.1-1 as appropriate.

8.3.3_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.3_2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.3.3_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.3_2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.3_2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.3_2.4.3-5: *MeaResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.3_2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.3_2.4.3-7: *FilterCoefficient*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

Table 8.3.3_2.4.3-8: *MeasObjectEUTRA-GENERIC(Freq)*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighCellConfig	'10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cells)		
offsetFreq	-14 (dB-14)	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

8.3.3_2.5 Test requirement

Tables 8.3.3_2.4.1-1, 8.3.3_2.5-1, 8.3.3_2.5-2 and 8.3.3_2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.3.3_2.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4.00	0.00	4.00	25.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s / N_{oc}$	dB	4.00	0.00	4.00	25.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-73.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-73.00
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.3_2.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.3_2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.3.3_2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.3.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.3.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition in FDD for HO.

8.3.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,inter} = T_{basic\_identify\_CGI,\,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.5 and A.8.3.4.

8.3.4.4 Test description

8.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 8.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.3.4.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.4.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.3.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.3.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.3.4.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message
12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays

measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.4.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.3.4.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.4.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.3.4.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.3.4.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.3.4.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.3.4.4.3-9: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.3.4.4.3-10: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.4.4.3-11: *SystemInformationBlockType5*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.4.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.3.4.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.3.4.4.3-14: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.4.4.3-15: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.3.4.5 Test requirement

Tables 8.3.4.4.1-1 and 8.3.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.3.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\ inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\ inter} = T_{basic\_identify\_CGI,\ inter} \quad ms$$

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.3.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.3.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition in FDD for HO. Applicability requires support for FGI bit 5.

8.3.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.5 and A.8.3.5.

8.3.5.4 Test description

8.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.5.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.5.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.3.5.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.3.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.5.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.3.5.4.3-10.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message.
12. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.
13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.5.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9

Table 8.3.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.5.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.3.5.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
...			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.3.5.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.5.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12(-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.3.5.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.5.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.3.5.4.3-10: MeasGapConfig-Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.3.5.4.3-11: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.3.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.3.5.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.3.5.4.3-14: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.3.5.4.3-15: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.3.5.5 Test requirement

Tables 8.3.5.4.1-1, 8.3.5.5-2 and 8.3.5.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.3.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.							
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 8.3.5.5-2: DRX configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,inter} = T_{basic\_identify\_CGI,\,inter} \quad ms$$

$T_{basic\_identify\_CGI,\,inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells

8.3.6.1 Test purpose

To verify theUE's ability to make a correct reporting of an event without measurement gaps within the E-UTRA FDD inter-frequency cell search requirements.

8.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward with support of Measurement without gaps. Applicability requires support for FGI bits 25.

8.3.6.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.6.3-1.

Table 8.3.6.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.6.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.
The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3 and A.8.3.6.

8.3.6.4 Test description

8.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.6.4.3.

5. There are two E-UTRA FDD carriers and two cells on different carrier frequencies and no gaps are configured in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.6.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active PCell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.3.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms and at least 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator until the measurement report is received during T2 the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.6.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.3.6.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.6.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.6.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.3.6.4.3-5: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.3.6.4.3-6: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

Table 8.3.6.4.3-7: *SystemInformationBlockType2*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.3.6.4.3-8: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.6.4.3-9: *SystemInformationBlockType5*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

8.3.6.5 Test requirement

Tables 8.3.6.4.1-1 and 8.3.6.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test.

Table 8.3.6.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event A3 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group

8.3.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports increased number of carrier monitoring.

8.3.7.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.7.3-1.

Table 8.3.7.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	480 x K_n x $N_{freq,n}$	480 x K_r x $N_{freq,r}$	6
1 (Note)	240 x K_n x $N_{freq,n}$	240 x K_r x $N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies or 8 FDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.3.7.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS 36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.7.

8.3.7.4 Test description

8.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.7.4.3.

5. There are nine E-UTRA FDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.7.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight FDD carrier frequencies are used in the UE neighbour cell list.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2, Cell 3, Cell 4	Cells 2, 3, 4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
Reduced Performance Group Scaling factor	-	8	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	s	5	
T2	s	40	

8.3.7.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.3.7.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 30.73s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
and
- randomly re-assign the frequencies for cells 2, 3 and 4 among the eight FDD carrier frequencies, according to table 8.3.7.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.7.5 Test requirement

Tables 8.3.7.4.1-1, 8.3.7.5-1 and 8.3.7.5-2 defines the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.7.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions (Cell 1 and Cell 2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4,5,6,7,8 such that cell 2 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.1.		5MHz: R.5 FDD 10MHz: R.0 FDD		-	
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1.		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD	
OCNG Patterns defined in D.1.		5MHz: OP.15 FDD 10MHz: OP.1 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-64.76+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.7.5-2: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions (Cell 3 and Cell 4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 2,3,4,5,6,7,8 such that cell 3 is in the normal performance group		Randomly selected from 2,3,4,5,6,7,8 such that cell 4 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.1.		-		-	
PDSCH allocation	n_{PRB}	-		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1.		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD	
OCNG Patterns defined in D.1.		5MHz: OP.16 FDD 10MHz: OP.2 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	-Infinity	7	-Infinity	7
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	3		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 30.72 s from the beginning of time period T2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.8 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, non DRX

8.3.8.1 Test purpose

To verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell measurement requirements for increased UE carrier monitoring in clause 8.1.2.3.

8.3.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports increased number of carrier monitoring.

8.3.8.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.7.3-1.

Table 8.3.7.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	$480 \times K_n \times N_{freq,n}$	$480 \times K_r \times N_{freq,r}$	6
1 (Note)	$240 \times K_n \times N_{freq,n}$	$240 \times K_r \times N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies or 8 FDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.3.7.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS 36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.8.

8.3.8.4 Test description

8.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.8.4.3.

5. There are nine E-UTRA FDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.8.4.1-1: General test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1,2,3,4,5,6,7,8,9	Serving cell and 8 FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration		Cell 1 uses E-UTRA RF cannel number 1 Cell 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor configurations		8	As specified in TS 36.133 clause 8.1.2.1.1a
T1	s	5	
T2	s	155	

8.3.8.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.3.8.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 13.17s for cell 2 and 153.6s for cells 3&4 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and

- randomly re-assign the frequencies for cells 2, 3 and 4 among the eight FDD carrier frequencies, according to table 8.3.8.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.8.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.8.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.8.5 Test requirement

Tables 8.3.8.4.1-1, 8.3.8.5-1 and 8.3.8.5-2 defines the primary level settings including test tolerances for event triggered reporting in asynchronous inter frequency cells test.

Table 8.3.8.5-1: Cell specific test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (cell #1, cell #2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group	
$BW_{channel}$		5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
PDSCH parameters: DL Reference Measurement Channel As specified in clause A.1.1		5MHz: R.5 FDD 10MHz:R.0 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel As specified in clause A.2.1		5MHz: R.11 FDD 10MHz:R.6 FDD		5MHz: R.11 FDD 10MHz:R.6 FDD	
OCNG Patterns defined in D.1		5MHz: OP.15 FDD 10MHz:OP.1 FDD		5MHz: OP.16.FDD 10MHz:OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$ Note 4	dB	4	4	-Infinity	7
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 4	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-64.76 +10log ($N_{RB,c}$ /50)	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Antenna Configuration		1x2		1x2	
Timing offset to Cell 1		-		3ms	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.8.5-2: Cell specific test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (cell #3, cell #4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 5,6,7,8,9 such that cell 3 is in the reduced performance group		Randomly selected from 5,6,7,8,9 such that cell 4 is in the reduced performance group. Cell 4 RF channel is different from Cell 3 RF channel.	
$BW_{channel}$		5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
PDSCH parameters: DL Reference Measurement Channel As specified in clause A.1.1		-		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel As specified in clause A.2.1		5MHz: R.11 FDD 10MHz:R.6 FDD		5MHz: R.11 FDD 10MHz:R.6 FDD	
OCNG Patterns defined in D.1		5MHz: OP.16.FDD 10MHz:OP.2 FDD		5MHz: OP.16.FDD 10MHz:OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	**-98**		**-98**	
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	-Infinity	7
$\hat{E}_s / I_{ot}$ Note 4	dB	-Infinity	7	-Infinity	7
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
Io Note 4	dBm/Ch BW	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Antenna Configuration		1x2		1x2	
Timing offset to Cell 1		3ms		3ms	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.17s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%. with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.3.9 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX

8.3.9.1 Test purpose

To verify that the UE makes correct reporting of an event in DRX. This test will partly verify the FDD-FDD inter-frequency cell measurement requirements for increased UE carrier monitoring in clause 8.1.2.3.

8.3.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports increased number of carrier monitoring. Applicability requires support for FGI bit 5.

8.3.9.3 Minimum conformance requirements

When DRX or eDRX_CONN is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter}$. When DRX is in use, $T_{identify\_inter}$ is as defined in Table 8.3.9.3-1, and when eDRX_CONN is in use, $T_{identify\_inter}$ is as defined in Table 8.3.9.3-1A.

Table 8.3.9.3-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles), normal performance		$T_{identify\_inter}$ (s) (DRX cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,n}$ ($30*K_n*N_{freq,n}$)	$5.12*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($30*K_r*N_{freq,r}$)
0.32	$6.4*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,nl}$ ($24*K_n*N_{freq,n}$)	$6.4*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($24*K_r*N_{freq,r}$)
0.32< DRX-cycle≤2.56	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_r*N_{freq,r}$)	Note ($20*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use				

Table 8.3.9.3-1A: Requirement to identify a newly detectable FDD inter-frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_inter}$ (s) (eDRX_CONN cycles), normal performance		$T_{identify\_inter}$ (s) (eDRX_CONN cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
2.56< eDRX_CONN cycle≤10.24	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_r*N_{freq,r}$)	Note ($20*K_r*N_{freq,r}$)
Note: Time depends upon the eDRX_CONN cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side conditions given in TS 36.133 [4] Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections TS 36.133 [4] 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections TS 36.133 [4] 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{measure\_inter}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is used, $T_{measure\_inter}$ is as defined in Table 8.3.9.3-2, and when eDRX_CONN is in use, $T_{measure\_inter}$ is as defined in Table 8.3.9.3-3.

Table 8.3.9.3-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal performance)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in clause 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

Table 8.3.9.3-3: Requirement to measure FDD inter-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_inter}$ (s) (eDRX_CONN cycles) (normal performance)	$T_{measure\_inter}$ (s) (eDRX_CONN cycles) (reduced performance)
2.56<eDRX_CONN cycle≤10.24	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the eDRX_CONN cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] in the sub-clauses 9.1.3.1 and 9.1.3.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] in the sub-clauses 9.1.6.1 and 9.1.6.2, and the RS-SINR measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] in the sub-clauses 9.1.17.3.1 and 9.1.17.3.2.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.9.

8.3.9.4 Test description

8.3.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.3.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.9.4.3.

5. There are nine E-UTRA FDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.9.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration		Cell 1,2,3,4	Cell 1 uses E-UTRA RF channel number 1 Cells 2 are randomly selected to use different frequencies selected from E-UTRA frequencies 2, 3, 4. Cells 3, 4 are randomly selected to use different frequencies selected from E-UTRA frequencies 5, 6, 7, 8, 9.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2,3,4	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-5	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	
Scaling factor for reduced performance group		8	
T1	s	5	
T2	s	155	

8.3.9.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.3.9.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 13.2s for cell1 and 153.6s for cells 3&4 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the

UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
and
- randomly re-assign the frequencies for cells 2, 3 and 4 among the eight FDD carrier frequencies, according to table 8.3.9.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.39.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.9.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.9.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.9.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.9.5 Test requirement

Table 8.3.9.1-2 define the primary level settings including test tolerances for event triggered reporting in asynchronous inter frequency cells test with reduced performance group configured, with DRX.

Table 8.3.9.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group		Randomly selected from 5, 6, 7, 8, 9 such that cell 3 is in the reduced performance group		Randomly selected from 5, 6, 7, 8, 9 such that cell 4 is in the reduced performance group	
Channel Bandwidth ($BW_{channel}$)	MHz	5MHz: NRB = 25 10MHz: NRB = 50		5MHz: NRB,= 25 10MHz: NRB,= 50		5MHz: NRB = 25 10MHz: NRB = 50		5MHz: NRB,= 25 10MHz: NRB,= 50	
PDSCH parameters as specified in clause A.3.1.1.1		5MHz: R.5 FDD 10MHz: R.0 FDD		-		-		-	
PCFICH/PDCCH/PHICH parameters as specified in clause A.3.1.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD	
OCNG Patterns defined in A.3.2.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD	
PBCH_RA	dB	0		0		0		0	
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 3	dBm/15 kHz	-98		-98		-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	5	-Infinity	5	-Infinity	5
$\hat{E}_s / I_{ot}$ Note 4	dB	4	4	-Infinity	5	-Infinity	5	-Infinity	5
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	-Infinity	-93	-Infinity	-93
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	-Infinity	-93	-Infinity	-93
Io Note 4	dBm/Ch BW	$-64.76+10\log(N_{RB,c}/50)$	$-64.76+10\log(N_{RB,c}/50)$	$-70.22+10\log(N_{RB,c}/50)$	$-64.76+10\log(N_{RB,c}/50)$	$-70.22+10\log(N_{RB,c}/50)$	$-64.76+10\log(N_{RB,c}/50)$	$-70.22+10\log(N_{RB,c}/50)$	$-64.76+10\log(N_{RB,c}/50)$
Propagation Condition		AWGN		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2		1x2	
Time offset to cell1	ms	-		3		3		3	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	E_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.2s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.3.10 to 8.3.11

8.3.12 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA

8.3.12.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event with discontinuous MPDCCH monitoring under fading propagation conditions in asynchronous cells. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.3.12.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD inter-frequency cell according to requirements in Table 8.3.12.3-1 when SCH Ês/Iot >= -6 dB, provided

- G=1, or
- r_{max}*G < 80ms, or
- UE is receiving PDSCH.

Otherwise, requirements in Table 8.3.12.3-3 apply, where r_{max} and G are given by higher layer parameter *mPDCCH-NumRepetition* and *mPDCCH-startSF-UESS* respectively as defined in TS 36.213.

Table 8.3.12.3-1: Requirement on cell identification delay and measurement delay for FDD interfrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1\_NC}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1\_NC\_NC}$)
0	1.44 * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	480 * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	2.88 * $K_{inter\_M1\_NC}$ seconds	960 * $K_{inter\_M1\_NC}$ ms

$$K_{inter\_M1\_NC} = \frac{N_{freq} * 100}{(100 - X)}$$

where X is signalled by the RRC parameter *measGapSharingScheme* [2] and is defined as in Table 8.3.12.3-2 when *highSpeedMeasGapCE-ModeA* [2] is not configured, and in Table 8.3.12.3-2A when *highSpeedMeasGapCE-ModeA* [2] is configured. N_{freq} is total number of inter-frequency layers to be monitored as defined in 8.1.2.1.1.

Table 8.3.12.3-2: Value of parameter X for CEModeA

measGapSharingScheme	Value of X (%)
'00'	$\frac{100}{N_{freq}+1}$
'01'	40
'10'	50
'11'	60

Table 8.3.12.3-2A: Value of parameter X for CEModeA for UE configured with *highSpeedMeasGapCE-ModeA*

measGapSharingScheme	Value of X (%)
'00'	$[\frac{100}{N_{freq}+1}]$
'01'	[50]
'10'	[80]
'11'	[90]

Table 8.3.12.3-3: Requirement on cell identification delay and measurement delay for FDD interfrequency cell with MPDCCH scaling

Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1}$)
0	Max(20 * r_{max}*G / 1000, 1.44) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 480) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	Max(20 * r_{max}*G / 1000, 2.88) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 960) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms

$$K_{RSTD\_M1\_NC} = \frac{1}{1 - \max(\frac{40}{T_{PRS}}, \frac{N_{PRS}}{T_{PRS}})}$$

$K_{RSTD\_M1\_NC}$ is applicable provided following conditions are met:

- $T_{PRS} > 40$ ms
- $T_{PRS} > N_{PRS}$

where

- T_{PRS} is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],
- N_{PRS} is the number of consecutive downlink positioning subframes in a positioning location defined in TS 36.211

Otherwise $K_{RSTD\_M1\_NC} = 1$.

A cell shall be considered detectable when

- RSRP related side conditions given in 36.133 Sections 9.1.21.9 and 9.1.22.10 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in 36.133 Clause 9.1.21.13 and 9.1.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to 36.133 Annex Table B.2.14-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_inter\_UE\ cat\ M1\_NC}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for inter frequency measurements is according to Table 8.13.2.6.1.1-1. When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.21.9, 9.1.21.10, 9.1.21.13 and 9.1.21.14.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 2 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.13.2.6.1.1-1.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in 36.133 in sections 9.1.21.9, 9.1.21.10, 9.1.21.13 and 9.1.21.14.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter\_UE\ cat\ M1\_NC}$ defined in Clause 8.13.2.6.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_UE\ cat\ M1\_NC}$ defined in clause 8.13.2.6.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1\_NC,\ Inter}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.1 and A.8.3.12.

8.3.12.4 Test description

8.3.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.3.12.4.1-1.
3. Propagation conditions are set according to Annex B.0.

4. Message contents are defined in clause 8.3.12.4.3.

5. There is two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.12.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
Rmax			8	As defined in *mPDCCH-NumRepetition* in [3]
G			10	As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme10	As defined in *measGapSharingScheme* in [3]
T1		S	5	
T2		S	5	

8.3.12.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA

2. Set the parameters according to T1 in Table 8.3.12.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.12.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3.2s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
   or

- switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.3.12.4.3-1: Common Exception messages for E-UTRAN FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA without gap test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7

Table 8.3.12.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme10		
}			
}			

Table 8.3.12.4.3-3: *ReportConfig-A3*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.12.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.3.12.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v10		
}			
mpdcch-NumRepetition-r13	r8		
}			
}			

8.3.12.5 Test requirement

Table 8.3.12.4.1-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.12.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98+TT			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	48.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	48.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	61.01+TT
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [819.2] s from the beginning of time period T2 which is derived from section 8.13.3.5.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.13 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA

8.3.13.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event with discontinuous MPDCCH monitoring under fading propagation conditions in asynchronous. This test will partly verify the HD-FDD inter-frequency cell search requirements.

8.3.13.2 Test applicability

This test applies to all types of E-UTRA HD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.3.13.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The requirements defined in clause 8.3.12.3 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 or downlink subframe # 5 per radio frame of an inter-frequency cell to be identified by the UE is available at the UE over $T_{identify\_inter\_UE\ cat\ M1\_NC}$;
- at least one downlink subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell over $T_{measure\_inter\_UE\ cat\ M1\_NC}$.
- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.9 and 9.1.21.10 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.21.13 and 9.1.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex Table B.2.14-2 for a corresponding Band

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.2 and A.8.3.13.

8.3.13.4 Test description

8.3.13.4.1 Initial conditions

Same initial conditions as in 8.3.12.4.1 with following exception:

Use E-UTRA HD-FDD carriers instead of E-UTRA FDD carriers.

8.3.13.4.2 Test procedure

Same test procedure as in 8.3.12.4.2.

8.3.13.4.3 Message contents

Same message content as in 8.3.12.4.3.

8.3.13.5 Test requirement

Table 8.3.13.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.13.5-1: Cell specific test parameters for E-UTRAN HD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.11 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98+TT			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	8.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	-61.01
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3.2 s from the beginning of time period T2. During the test, downlink traffic is continuously scheduled.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.14 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB

8.3.14.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event with discontinuous MPDCCH monitoring under fading propagation conditions in asynchronous cells. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.14.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.3.14.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

When no DRX is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify and measure a new detectable FDD inter-frequency cell according to requirements in Table 8.13.3.5.1.1-1 when additional condition in Table 8.13.3.5.1.1-1 is met, and

- G=1, or
- r_{max}*G < 800ms, or
- UE is receiving PDSCH.

Otherwise, requirements in Table 8.13.3.5.1.1-3 apply, where r_{max} and G are given by higher layer parameter *mPDCCH-NumRepetition* and *mPDCCH-startSF-UESS* respectively as defined in TS 36.213 [3].

Table 8.13.3.5.1.1-1: Requirement on cell identification delay and measurement delay for FDD interfrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤ Q2 < -6	0	320.8 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ s	800 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms
	1	321.6 * K_{inter_M1} s	1600 * K_{inter_M1} ms
Q2≥-6	0	21.8 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ s	800 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms
	1	22.6 * $K_{inter\_M1\_EC}$ s	1600 * $K_{inter\_M1\_EC}$ ms

$$K_{inter\_M1\_EC} = \frac{N_{freq} * 100}{(100 - X)}$$

where X is signalled by the RRC parameter *measGapSharingScheme* [2] and is defined as in Table 8.13.3.5.1.1-2. N_{freq} is total number of inter-frequency layers to be monitored as defined in 8.1.2.1.1.

Table 8.13.3.5.1.1-2: Value of parameter X for CEModeB

measGapSharingScheme	Value of X (%)
'00'	$\frac{100}{N_{freq}+1}$
'01'	50
'10'	75
'11'	87.5

Table 8.13.3.5.1.1-3: Requirement on cell identification delay and measurement delay for FDD interfrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1)}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1)}$)
-15≤ Q2 < -6	0	Max(400 * r_{max}* G / 1000, 320.8) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 800) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms
	1	Max(400 * r_{max}* G / 1000, 321.6) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms
Q2≥-6	0	Max(20 * r_{max}* G / 1000, 21.8)* $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 800) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms
	1	Max(20 * r_{max}* G / 1000, 22.6)* $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms

$$K_{RSTD\_M1\_EC} = \frac{1}{1 - \max(\frac{40}{T_{PRS}}, \frac{N_{PRS}}{T_{PRS}})}$$

$K_{RSTD\_M1\_NC}$ is applicable provided following conditions are met:

- T_{PRS} > 40 ms
- T_{PRS} > N_{PRS}

where

- T_{PRS} is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],
- N_{PRS} is the number of consecutive downlink positioning subframes in a positioning location defined in TS 36.211

Otherwise $K_{RSTD\_M1\_EC}$ = 1.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.11 and 9.1.21.12 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.15 and 9.1.21.16 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.18-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_inter\_UE\ cat\ M1\_EC}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for inter frequency measurements is according to Table 8.13.3.5.1.1-1. When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.13.3.5.1.1-1.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.5.1 and A.8.3.14.

8.3.14.4 Test description

8.3.14.4.1 Initial conditions

Same initial conditions as in 8.3.12.4.1 with following exception:

Use Table 8.3.14.4.1-1 instead of Table 8.3.12.4.1-1

Table 8.3.14.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
Rmax			128	As defined in *mPDCCH-NumRepetition* in [3]
G			8	As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme01	As defined in *measGapSharingScheme* in [3]
T1		S	5	
T2		S	≤825	

8.3.14.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA

2. Set the parameters according to T1 in Table 8.3.14.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.14.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 819.2s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and

ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
or
- switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.3.12.4.3-1: Common Exception messages for E-UTRAN FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA without gap test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7

Table 8.3.14.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme01		
}			
}			

Table 8.3.14.4.3-3: *ReportConfig-A3*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.14.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.3.14.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA without gap test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v8		
}			
mpdcch-NumRepetition-r13	r128		
}			
}			

8.3.14.5 Test requirement

Table 8.3.14.4.1-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.14.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10 for 10 MHz cell BW: 5 for 5 MHz cell BW		10 for 10 MHz cell BW: 5 for 5 MHz cell BW	
PDSCH parameters: DL Reference Measurement Channel		R.23 FDD for 10 MHz cell BW R.31 FDD for 5 MHz cell BW		-	
MPDCCH parameters: DL Reference Measurement Channel		R.19 FDD for 10 MHz cell BW R.27 FDD for 10 MHz cell BW		R.19 FDD for 10 MHz cell BW R.27 FDD for 10 MHz cell BW	
OCNG Patterns		OP.21 FDD for 10 MHz cell BW OP.22 FDD for 5 MHz cell BW		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
	dBm/4.5 MHz	-72.96	-72.96	-Infinity	-72.64
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3.2 s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to *pusch-maxNumRepetitionCEmodeB* x TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured

8.3.15 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB

8.3.15.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event with discontinuous MPDCCH monitoring under fading propagation conditions in asynchronous cells. This test will partly verify the HD-FDD inter-frequency cell search requirements.

8.3.15.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.3.15.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

The requirements defined in clause 8.3.15.3 also apply for this section provided the following conditions are met:

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.11 and 9.1.21.12 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.21.15 and 9.1.21.16 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex Table B.2.18-2 for a corresponding Band

The normative reference for this requirement is TS 36.133 [4] clause TBD and A.8.3.15.

8.3.15.4 Test description

8.3.15.4.1 Initial conditions

Same initial conditions as in 8.3.14.4.1 with following exception:

Use E-UTRA HD-FDD carriers instead of E-UTRA FDD carriers.

8.3.15.4.2 Test procedure

Same test procedure as in 8.3.14.4.2.

8.3.15.4.3 Message contents

Same message content as in 8.3.14.4.3.

8.3.15.5 Test requirement

Table 8.3.15.4.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.15.5-1: Cell specific test parameters for E-UTRAN HD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10 for 10 MHz cell BW 5 for 5 MHz cell BW		10 for 10 MHz cell BW: 5 for 5 MHz cell BW	
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD for 10 MHz cell BW R.21 HD-FDD for 5 MHz cell BW		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD for 10 MHz cell BW R.17 HD-FDD for 5 MHz cell BW:		R.9 HD-FDD for 10 MHz cell BW: R.17 HD-FDD for 5 MHz cell BW:	
OCNG Patterns		OP.21 FDD for 10 MHz cell BW OP.22 FDD for 5 MHz cell BW		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
	dBm/4.5 MHz	-72.96	-72.96	-Infinity	-72.64
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 819.2 s from the beginning of time period T2 which is derived from section 8.13.3.5.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to *pusch-maxNumRepetitionCEmodeB* x TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured

8.3.16 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used

8.3.16.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.16.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL and non-BL CE UEs.

8.3.16.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_NC}$ as shown in table 8.13.2.6.1.2-1.

When eDRX_CONN is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_NC}$ as shown in table 8.13.2.6.1.2-1A.

Table 8.13.2.6.1.2-1: Requirement to identify a newly detectable FDD interfrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	≤0.04	1.44 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.04<DRX-cycle≤0.08	Note 2 (40 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128	3.2 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (25 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(20 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	<0.128	2.88 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.128	3.2 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (25 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(20 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.1.2-1A: Requirement to identify a newly detectable FDD interfrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.9 and 9.1.21.10 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.13 and 9.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.14-1 for a corresponding Band

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_NC}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is used, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.1.2-2, and when eDRX_CONN is in use, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.1.2-3.

Table 8.13.2.6.1.2-2: Requirement to measure FDD interfrequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	<0.128	0.48 * $K_{inter\_M1\ cat\ M1\_NC}$ * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.128≤DRX-cycle≤2.56	Note 2 (5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	<0.256	0.960 * $K_{inter\_M1\ cat\ M1\_NC}$ * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.256≤DRX-cycle≤2.56	Note 2 (5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.1.2-3: Requirement to measure FDD interfrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.9 and 9.1.21.10.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.13 and 9.1.21.14.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.2.2 and A.8.3.16.

8.3.16.4 Test description

8.3.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.3.16.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.3.16.4.3.
5. There is two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.16.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA when DRX is used

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1, 2		
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		
A3	Offset	dB	-6		
	Hysteresis	dB	0		
	Time To Trigger	S	0		
Filter coefficient			0		L3 filtering is not used
Gap pattern ID			0		
Rmax			8		As defined in *mPDCCH-NumRepetition* in TS 36.331
G			1		As defined in *mPDCCH-startSF-UESS* in TS 36.331
X			scheme10		As defined in *measGapSharingScheme* in TS 36.331
T1		S	5		
T2		S	10	60	

8.3.16.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA

2. Set the parameters according to T1 in Table 8.3.16.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.16.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 6.4 s for Test 1 and less than 51.2 s for Test 2 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and

ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
or
- switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.16.4.1-1 as appropriate.

8.3.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.3.16.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.7.1-1

Table 8.3.16.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme10		
}			
}			

Table 8.3.16.4.3-3: *ReportConfig-A3*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.16.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.3.16.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
}			
}			

Table 8.3.16.4.3-6: *drx-Config:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf128	0		Test 1
sf1280	0		Test 2
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.3.16.4.3-7: SchedulingRequest-Config: Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3 Table 4.6.3-20			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-ConfigIndex	0		
}			
}			

8.3.16.5 Test requirement

Tables 8.3.16.5-1, 8.3.16.5-2, 8.3.16.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.16.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	8.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	-61.01
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.3.16.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	disable	disable	

Table 8.3.16.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6.4 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 51.2 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

8.3.17 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used

8.3.17.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.17.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL and non-BL CE UEs.

8.3.17.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_NC}$ as shown in table 8.13.2.6.2.2-1.

When eDRX_CONN is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_NC}$ as shown in table 8.13.2.6.2.2-1A.

Table 8.13.2.6.2.2-1: Requirement to identify a newly detectable HD-FDD interfrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	≤0.04	1.44 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note1)
	0.04<DRX-cycle≤0.08	Note 2 (40 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128	3.2 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (32 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(25 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	≤0.08	2.88 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note1)
	0.128	3.2 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (32 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(25 * K_{inter_M} * $K_{RSTD\_M1\_NC\ 1}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.2.2-1A: Requirement to identify a newly detectable HD-FDD interfrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (25 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.9 and 9.1.21.10 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.13 and 9.1.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.14-2 for a corresponding Band

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_NC}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is used, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.2.2-2, and when eDRX_CONN is in use, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.2.2-3.

Table 8.13.2.6.2.2-2: Requirement to measure HD-FDD interfrequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	<0.08	0.48 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.08≤DRX-cycle≤0.16	Note 2 (7 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.16<DRX-cycle≤2.56	Note 2(5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	<0.16	0.96 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	DRX-cycle=0.16	1.12 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (7 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.16<DRX-cycle≤2.56	Note 2(5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.2.2-3: Requirement to measure HD-FDD interfrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5 * K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.10 and 9.1.21.11.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.13 and 9.1.21.14.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.2.2 and A.8.3.17.

8.3.17.4 Test description

8.3.17.4.1 Initial conditions

Same initial conditions as in 8.3.16.4.1 with following exception:

Use E-UTRA HD-FDD carriers instead of E-UTRA FDD carriers.

8.3.17.4.2 Test procedure

Same test procedure as in 8.3.16.4.2 with the following exceptions:

Instead of Table 8.3.16.5-1 use Table 8.3.17.5-1.

8.3.17.4.3 Message contents

Same message content as in 8.3.16.4.3.

8.3.17.5 Test requirement

Tables 8.3.17.5-1, 8.3.17.5-2, 8.3.17.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.17.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.11 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.7 HD-FDD		R.7 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.6 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	8.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	-61.01
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.3.17.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	disable	disable	

Table 8.3.17.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6.4 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 51.2 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

8.3.18 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used

8.3.18.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.18.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL and non-BL CE UEs.

8.3.18.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1\_EC}$ as shown in table 8.13.3.1.1.2-1 provided that additional conditions Table 8.13.3.1.1.2-1 is met.

When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1\_EC}$ as shown in table 8.13.3.1.1.2-1B.

Table 8.13.3.1.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
-15≤ Q2 < -6	0	≤0.64	320.8 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2 (400 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	321.6 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(400 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
Q2≥-6	0	≤0.64	21.8 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(24 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	22.6 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(24 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use			

Table 8.13.3.1.1.2-1A: Void

Table 8.13.3.1.1.2-1B: Requirement to identify a newly detectable FDD intrafrequency cell when eDRX_CONN is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (400 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.7 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.14-3 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1\_EC}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1\_EC}$ is as specified in table 8.13.3.1.1.2-2 provided that additional conditions table 8.13.3.1.1.2-2 is met. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1\_EC}$ is as specified in table 8.13.3.1.1.2-4. The UE shall be capable of performing RSRP and RSRQ measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1\_EC}$.

Table 8.13.3.1.1.2-2: Requirement to measure FDD intrafrequency cells

Target cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
Q2≥-15	0	≤0.16	0.8 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ (Note1)
		0.16<DRX-cycle≤2.56	Note2(5 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
	1	≤0.32	1.6 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ (Note1)
		0.32<DRX-cycle≤2.56	Note2(5 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use			

Table 8.13.3.1.1.2-3: Void

Table 8.13.3.1.1.2-4: Requirement to measure FDD intrafrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5 * $K_{intra\_M1\_EC}$* $K_{RSTD\_M1\_EC}$)
NOTE: Time depends upon the eDRX_CONN cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.7.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.1.2 and A.8.3.18.

8.3.18.4 Test description

8.3.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.3.18.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.3.18.4.3.
5. There is two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.18.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeB when DRX is used

Parameter		Unit	Value		Comment
E-UTRA RF Channel Number			1, 2		
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		
A3	Offset	dB	-8		
	Hysteresis	dB	0		
	Time To Trigger	S	0		
Filter coefficient			0		L3 filtering is not used
Gap pattern ID			0		
Rmax			8		As defined in *mPDCCH-NumRepetition* in [3]
G			1		As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme01		As defined in *measGapSharingScheme* in [3]
T1		S	5		
T2		S	≤650	≤1030	

8.3.18.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA

2. Set the parameters according to T1 in Table 8.3.18.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.18.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 641.6 s for Test 1 and less than 1024 s for Test 2 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.18.4.1-1 as appropriate.

8.3.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.3.18.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeB in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.7.1-1

Table 8.3.18.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme01		
}			
}			

Table 8.3.18.4.3-3: *ReportConfig-A3*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.18.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.3.18.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeB in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
}			
}			

Table 8.3.18.4.3-6: *drx-Config:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeB in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf128	0		Test 1
sf1280	0		Test 2
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.3.18.4.3-7: SchedulingRequest-Config: Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeB in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3 Table 4.6.3-20			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-ConfigIndex	0		
}			
}			

8.3.18.5 Test requirement

Tables 8.3.18.5-1, 8.3.18.5-2, 8.3.18.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.18.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10 for 10 MHz cell BW: 5 for 5 MHz cell BW		10 for 10 MHz cell BW: 5 for 5 MHz cell BW	
PDSCH parameters: DL Reference Measurement Channel		R.23 FDD for 10 MHz cell BW R.31 FDD for 5 MHz cell BW		-	
MPDCCH parameters: DL Reference Measurement Channel		R.19 FDD for 10 MHz cell BW R.27 FDD for 5 MHz cell BW		R.19 FDD for 10 MHz cell BW R.27 FDD for 5 MHz cell BW	
OCNG Patterns		OP.21 FDD for 10 MHz cell BW OP.22 FDD for 5 MHz cell BW		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
	dBm/4.5 MHz	-72.96	-72.96	-Infinity	-72.64
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.3.18.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	disable	disable	

Table 8.3.18.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 641.6 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1024 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

8.3.19 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used

8.3.19.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.3.19.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL and non-BL CE UE.

8.3.19.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use the UE shall be able to identify a new detectable HD-FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1\_EC}$ as shown in table 8.13.3.1.2.2-1 provided that additional conditions table 8.13.3.1.2.2-1 is met.

When eDRX_CONN is in use, the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1\_EC}$ as shown in table 8.13.3.1.2.2-1B.

Table 8.13.3.1.2.2-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
-15≤ Q2 < -6	0	≤0.64	320.8 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2 (400 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	321.6 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(400 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$)
Q2≥-6	0	≤0.64	21.8 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2 (24 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	22.6 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(24 * K_{intra_M1} * $K_{RSTD\_M1\_EC}$)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use			

Table 8.13.3.1.2.2-1A: Void

Table 8.13.3.1.2.2-1B: Requirement to identify a newly detectable HD-FDD intrafrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (400 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.7 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.14-4 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1\_EC}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1\_EC}$ is as specified in table 8.13.3.1.2.2-2 provided that additional conditions Table 8.13.3.1.2.2-2 is met. When eDRX_CONN cycle is used, $T_{measure\_intra\_UE\ cat\ M1\_EC}$ is as specified in table 8.13.3.1.2.2-4. The UE shall be capable of performing RSRP and RSRQ measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1\_EC}$.

Table 8.13.3.1.2.2-2: Requirement to measure HD-FDD intrafrequency cells

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
Q2≥-15	0	<0.128	0.8 * K_{intra_EC} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.128≤DRX-cycle≤0.16	Note2 (7 * K_{intra_EC} * $K_{RSTD\_M1\_EC}$)
		0.16<DRX-cycle≤2.56	Note2(5 * K_{intra_EC} * $K_{RSTD\_M1\_EC}$)
	1	≤0.32	1.6 * K_{intra_EC} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.32<DRX-cycle≤2.56	Note2(5 * K_{intra_EC} * $K_{RSTD\_M1\_EC}$)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use			

Table 8.13.3.1.2.2-3: Void

Table 8.13.3.1.2.2-4: Requirement to measure HD-FDD intrafrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	NOTE (5 * $K_{intra\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$)
NOTE: Time depends upon the eDRX_CONN cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.7.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.2.2 and A.8.3.19.

8.3.19.4 Test description

8.3.19.4.1 Initial conditions

Same initial conditions as in 8.3.18.4.1 with following exception:

Use E-UTRA HD-FDD carriers instead of E-UTRA FDD carriers.

8.3.19.4.2 Test procedure

Same test procedure as in 8.3.18.4.2 with the following exceptions:

Instead of Table 8.3.18.5-1 use Table 8.3.19.5-1.

8.3.19.4.3 Message contents

Same message content as in 8.3.18.4.2.

8.3.19.5 Test requirement

Tables 8.3.19.5-1, 8.3.19.5-2, 8.3.19.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.3.19.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10 for 10 MHz cell BW 5 for 5 MHz cell BW		10 for 10 MHz cell BW 5 for 5 MHz cell BW	
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD for 10 MHz cell BW R.21 HD-FDD for 5 MHz cell		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD for 10 MHz cell BW R.17 HD-FDD for 5 MHz cell BW:		R.9 HD-FDD for 10 MHz cell BW: R.17 HD-FDD for 5 MHz cell BW:	
OCNG Patterns		OP.21 FDD for 10 MHz cell BW OP.22 FDD for 5 MHz cell BW		OP.6 FDD for 10 MHz cell BW: OP.19 FDD for 5 MHz cell BW	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
	dBm/4.5 MHz	-72.96	-72.96	-Infinity	-72.64
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.3.19.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	Disable	disable	

Table 8.3.19.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB when DRX is used

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 641.6 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1024 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

8.4 E-UTRAN TDD-TDD inter frequency measurements

8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.4.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.4.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively are fulfilled.
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the

event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.1.

8.4.1.4 Test description

8.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.1.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.1.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.1.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.4.1.5 Test requirement

Tables 8.4.1.4.1-1 and 8.4.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.30
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-90.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.1_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis

8.4.1_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.1_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward. Applicability requires support for FGI bit 25 of UE category 1bis.

8.4.1_2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively are fulfilled.
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1_2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations (category 1bis)

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	960 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
2	6	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	1440 x N_{freq}
3 (Note 1)	50	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	960 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.1.

8.4.1_2.4 Test description

8.4.1_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.4.1_2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.1_2.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.1_2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.1_2.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.1_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.1_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.1_2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.1_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.1_2.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.1_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.4.1_2.5 Test requirement

Tables 8.4.1_2.4.1-1 and 8.4.1_2.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.1_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x1 Low		1x1 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	8.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-89.30
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-89.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

8.4.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.4.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.2.3-1.

Table 8.4.2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms

≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.2.3-2.

Table 8.4.2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in section 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.2 and A.8.4.2.

8.4.2.4 Test description

8.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.2.4.3.

5. There are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		

PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
E-UTRA RF Channel Number		1, 2		Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.4.2.4.1-2
Time offset between cells	µs	3		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.2.4.1-1 as appropriate.

8.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.4.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.4.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.2.4.3-5: *MeasResults:* Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.4.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.4.2.5 Test requirement

Tables 8.4.2.5-1, 8.4.2.5-2 and 8.4.2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.4.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.4.2.5-2: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.4.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213 [8].

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.4.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.2_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells for UE category 1bis

8.4.2_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.4.2_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward. Applicability requires support for FGI bits 5, and 25 of UE category 1bis.

8.4.2_2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.2_2.3-1.

Table 8.4.2_2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms

≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.3 and 9.1.3.4 and RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.2_2.3-2.

Table 8.4.2_2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in section 8.1.2.3.1.1 of 36.133 are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.3.3 and 9.1.3.4, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.5 and 9.1.6.6.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay

uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.2.

8.4.2_2.4 Test description

8.4.2_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.4.2_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.2_2.4.3.
5. There are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.2_2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		

PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
E-UTRA RF Channel Number		1, 2		Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.4.2_2.4.1-2
Time offset between cells	µs	3		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.4.2_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.2_2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.2_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.2_2.4.1-1 as appropriate.

8.4.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.2_2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.4.2_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.4.2_2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.2_2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.2_2.4.3-5: *MeasResults:* Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.2_2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.4.2_2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.4.2_2.5 Test requirement

Tables 8.4.2_2.5-1, 8.4.2_2.5-2 and 8.4.2_2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.4.2_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x1 Low		1x1 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	8.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-89.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	8.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.2_2.5-2: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.4.2_2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213 [8].

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.4.2_2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used

8.4.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.4.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.4.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.3.3-1

Table 8.4.3.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.3.3-2.

Table 8.4.3.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.08 <DRX-cycle ≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.2 and A.8.4.3.

8.4.3.4 Test description

8.4.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.3.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.3.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Time offset between cells	μs	3	synchronous cells
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Uplink-downlink configuration of cells		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cells		6	As specified in table 4.2.1 in TS 36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.4.3.5-2
T1	s	30	
T2	s	9	

8.4.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.3.5-1 and 8.4.3.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of “successes” is increased by one. Otherwise count a fail.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:

- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.3.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.4.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.4.3.4.3-3: *MeasObjectEUTRA-GENERIC(f2)*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for frequency f2 defined in 36.508		
allowedmeasBandwidth	The number of the resource blocks for frequency f2		
presenceAntennaPort1	FALSE		
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
offsetFreq	dB-14	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

Table 8.4.3.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.3.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.3.4.3-6: *MeaResults*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.3.4.3-8: *FilterCoefficient*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

8.4.3.5 Test requirement

Tables 8.4.3.4.1-1, 8.4.3.5-1, 8.4.3.5-2 and 8.4.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.4.3.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4.00	0.00	4.00	24.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s / N_{oc}$	dB	4.00	0.00	4.00	24.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.3.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.4.3.5-3: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.4.3.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.3_2 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used for UE category 1bis

8.4.3_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.4.3_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward. Applicability requires support for FGI bits 5, and 25 of UE category 1bis.

8.4.3_2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.3_2.3-1

Table 8.4.3_2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.3 and 9.1.3.4 and RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.3_2.3-2.

Table 8.4.3_2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.08 <DRX-cycle ≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.3.3 and 9.1.3.4, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.5 and 9.1.6.6.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.3, 9.1.3.4, 9.1.6.5, and 9.1.6.6, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.3.

8.4.3_2.4 Test description

8.4.3_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.4.3_2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.3_2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.3_2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Time offset between cells	µs	3	synchronous cells
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Uplink-downlink configuration of cells		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cells		6	As specified in table 4.2.1 in TS 36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.4.3_2.5-2
T1	s	30	
T2	s	9	

8.4.3_2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.3_2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.3_2.5-1 and 8.4.3_2.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of "successes" is increased by one. Otherwise count a fail.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:

- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.3_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.3_2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.4.3_2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.4.3_2.4.3-3: *MeasObjectEUTRA-GENERIC(f2)*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for frequency f2 defined in 36.508		
allowedmeasBandwidth	The number of the resource blocks for frequency f2		
presenceAntennaPort1	FALSE		
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
offsetFreq	dB-14	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

Table 8.4.3_2.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.3_2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.3_2.4.3-6: *MeaResults*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.3_2.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.3_2.4.3-8: *FilterCoefficient*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

8.4.3_2.5 Test requirement

Tables 8.4.3_2.4.1-1, 8.4.3_2.5-1, 8.4.3_2.5-2 and 8.4.3_2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.4.3_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4.00	0.00	4.00	25.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s / N_{oc}$	dB	4.00	0.00	4.00	25.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-73.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-73.00
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.3_2.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.4.3_2.5-3: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.4.3_2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.4 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.4.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.4.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition in TDD for HO.

8.4.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $\geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 48,53 and SCH Ês/Iot $\geq$ - 4 dB.
- SCH_RP $\geq$ -124 dBm for Band 41 and SCH Ês/Iot $\geq$ - 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in TS 36.133 [4] Table 8.1.2.3.2.1-1 is used, the UE shall have more than 30 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.7 and A.8.4.4.

8.4.4.4 Test description

8.4.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 8.4.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.4.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.4.4.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.4.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.4.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.4.4.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.

9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message.

12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.4.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.4.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.4.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.4.4.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.4.4.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.4.4.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.4.4.4.3-9: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.4.4.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.4.4.4.3-11: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.4.4.5 Test requirement

Tables 8.4.4.4.1-1 and 8.4.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.4.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\ inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\ inter} = T_{basic\_identify\_CGI,\ inter} \quad ms$$

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Section TS 36.133 [4] 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.4.5 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.4.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX.

8.4.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 5.

8.4.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $\geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 48,53 and SCH Ês/Iot $\geq$ - 4 dB.
- SCH_RP $\geq$ -124 dBm for Band 41 and SCH Ês/Iot $\geq$ - 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.7 and A.8.4.5.

8.4.5.4 Test description

8.4.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.5.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.5.4.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.4.5.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	µs	3	Synchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.4.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.5.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.4.5.4.3-10.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message.
12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.
13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.5.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9

Table 8.4.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.4.5.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.4.5.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.4.5.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.5.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12(-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.4.5.4.3-7: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.5.4.3-9 *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.4.5.4.3-10: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.4.5.4.3-11: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.4.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.4.5.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.4.5.4.3-14: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.4.5.4.3-15: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.4.5.5 Test requirement

Tables 8.4.5.4.1-1 ,8.4.5.5-1, 8.4.5.5-2 and 8.4.5.5-3 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test.

Table 8.4.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.5.5-2: DRX configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.4.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\ inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\ inter} = T_{basic\_identify\_CGI,\ inter} \quad ms$$

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.6 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0

8.4.6.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.2.

8.4.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 25.

8.4.6.3 Minimum conformance requirements

When measurement gaps other than nonUniform1 – nonUniform4 are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

- When configuration 2 or configuration 3 in Table 8.1.2.3.2.1-1 is applied,

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} + 240 \cdot N_{freq} \quad ms,$$

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in clause 8.1.2.1.1 and T_{inter1} is defined in clause 8.1.2.1

For UE other than category 1bis UE, a cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.1.2.3.2.1-1:

Table 8.1.2.3.2.1-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms] (normal performance)	$T_{Measurement\_Period\_TDD\_Inter}$ [ms] (reduced performance)
		DL	UL	Normal CP	Extended CP		
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x K_n x $N_{freq,n}$	480 x K_r x $N_{freq,r}$
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x K_n x $N_{freq,n}$	240 x K_r x $N_{freq,r}$
2	6	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	720 x K_n x $N_{freq,n}$	720 x K_r x $N_{freq,r}$
3 (Note 1)	50	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x K_n x $N_{freq,n}$	480 x K_r x $N_{freq,r}$
4	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	T_{burst} x N_{freq}	T_{burst} x N_{freq}
5 (Note 3)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	½ x T_{burst} x N_{freq}	½ x T_{burst} x N_{freq}
6	6	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	3/2·T_{burst} x N_{freq}	3/2 x T_{burst} x N_{freq}
7 (Note 3)	50	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	T_{burst} x N_{freq}	T_{burst} x N_{freq}

Note 1: This configuration is optional
Note 2: T_s is defined in TS 36.211 [16]
Note 3: This configuration is optional and when nonUniform1 – nonUniform4 are configured

The UE shall be capable of performing RSRP, RSRQ, RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ or $T_{identify\ –inter\text{-}perCC}$ when per-CC based measurement gap configured defined in clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ or $T_{identify\ –inter\text{-}perCC}$ when per-CC based measurement gap configured defined in clause 8.1.2.3.2.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\_Inter}$ defined in clause 8.1.2.3.2.1 provided the timing to that cell has not changed more than ± 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.6.

8.4.6.4 Test description

8.4.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.6.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.6.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		0	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	**10**	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.6.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.6.5-1. Propagation conditions are set according to Annex B clauses B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7922 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.6.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.6.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.6.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.6.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.6.4.3-5: *SystemInformationBlockType1*

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	Ssp6		
}			
}			

8.4.6.5 Test requirement

Tables 8.4.6.4.1-1 and 8.4.6.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.30
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-90.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7922 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms.

The overall delays measured shall be less than a total of 7922 ms in this test case (note: a total of 7920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.6_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 for UE category 1bis

8.4.6_2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.2.

8.4.6_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward. Applicability requires support for FGI bit 25 of UE category 1bis.

8.4.6_2.3 Minimum conformance requirements

When measurement gaps other than nonUniform1 – nonUniform4 are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

- When configuration 2 or configuration 3 in Table 8.1.2.3.2.1-1 is applied,

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} + 240 \cdot N_{freq} \quad ms,$$

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in clause 8.1.2.1.1 and T_{inter1} is defined in clause 8.1.2.1

For category 1bis UE, a cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Clause 9.1.3.3 and 9.1.3.4 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.5 and 9.1.6.6 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

For category 1bis UE, when measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.3.3, 9.1.3.4, 9.1.6.5 and 9.1.6.6, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.6_2.3-1:

Table 8.4.6_2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations (category 1bis)

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	960 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
2	6	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	1440 x N_{freq}
3 (Note 1)	50	1	3	$19760 \cdot T_s$	$20480 \cdot T_s$	960 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The category 1bis UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$ given by table 8.4.6_2.3-1.

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.3.3, 9.1.3.4, 9.1.6.5, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ or $T_{identify\ –inter\text{-}perCC}$ when per-CC based measurement gap configured defined in clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ or $T_{identify\ –inter\text{-}perCC}$ when per-CC based measurement gap configured defined in clause 8.1.2.3.2.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\_Inter}$ defined in clause 8.1.2.3.2.1 provided the timing to that cell has not changed more than ± 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.6.

8.4.6_2.4 Test description

8.4.6_2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.4.6_2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.6_2.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.6_2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		0	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.6_2.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.6_2.5-1. Propagation conditions are set according to Annex B clauses B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.6_2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7922 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.6_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.6_2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.6_2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.6_2.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.6_2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.6_2.4.3-5: SystemInformationBlockType1

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	Ssp6		
}			
}			

8.4.6_2.5 Test requirement

Tables 8.4.6_2.4.1-1 and 8.4.6_2.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.6_2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x1 Low		1x1 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	8.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-89.30
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-89.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7922 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms.

The overall delays measured shall be less than a total of 7922 ms in this test case (note: a total of 7920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group

8.4.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports increased number of carrier monitoring.

8.4.7.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.4.7.3-1.

Table 8.4.7.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_TDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_TDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	$480 \times K_n \times N_{freq,n}$	$480 \times K_r \times N_{freq,r}$	6
1 (Note)	$240 \times K_n \times N_{freq,n}$	$240 \times K_r \times N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies or 8 TDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.4.7.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS 36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_TDD}$ defined in TS 36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.4.7.

8.4.7.4 Test description

8.4.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.7.4.3.

5. There are nine E-UTRA TDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.7.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight TDD carrier frequencies are used in the UE neighbour cell list.
Test equipment configuration		Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	80	

8.4.7.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.4.7.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 30.73s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the eight TDD carrier frequencies, according to table 8.4.7.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.7.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.7.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.4.7.5 Test requirement

Tables 8.4.7.4.1-1, 8.4.7.5-1 and 8.4.7.5-2 defines the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.7.5-1: Cell specific test requirement parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions (Cell 1 and Cell 2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4,5,6,7,8 such that cell 2 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.2.		5MHz: R.5 TDD 10MHz: R.0 TDD		-	
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2.		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD	
OCNG Patterns defined in D.2.		5MHz: OP.15 TDD 10MHz: OP.1 TDD		5MHz: OP.16 TDD 10MHz: OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-64.76+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.7.5-2: Cell specific test requirement parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions (Cell 3 and Cell 4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 2,3,4,5,6,7,8 such that cell 3 is in the normal performance group		Randomly selected from 2,3,4,5,6,7,8 such that cell 4 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.2.		-		-	
PDSCH allocation	n_{PRB}	-		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2.		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD	
OCNG Patterns defined in D.2.		5MHz: OP.16 TDD 10MHz: OP.2 TDD		5MHz: OP.16 TDD 10MHz: OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	-Infinity	7	-Infinity	7
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-infinity	-91	-infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	3		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 61.44 s from the beginning of time period T2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.8 TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

8.4.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports increased number of EUTRA carrier monitoring.

8.4.8.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.4.7.3-1.

Table 8.4.8.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_TDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_TDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	$480 \times K_n \times N_{freq,n}$	$480 \times K_r \times N_{freq,r}$	6
1 (Note)	$240 \times K_n \times N_{freq,n}$	$240 \times K_r \times N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies or 8 TDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.4.8.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS 36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_TDD}$ defined in TS 36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.4.8.

8.4.8.4 Test description

8.4.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.8.4.3.

5. There are nine E-UTRA TDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.8.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting for IncMon with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1,2,3,4,5,6,7,8,9	Serving cell and 8 TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration		Cell 1 uses E-UTRA RF cannel number 1 Cell 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor configurations		8	As specified in TS 36.133 clause 8.1.2.1.1a
T1	s	5	
T2	s	155	

8.4.7.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.4.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.4.7.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 13.17s (cell 2) and 153.6s (cell 3 and 4) the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and

- randomly re-assign the frequencies for cells 2, 3 and 4 among the eight TDD carrier frequencies, according to Table 8.4.8.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.8.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.8.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.4.8.5 Test requirement

Tables 8.4.8.4.1-1, 8.4.8.5-1 and 8.4.8.5-2 defines the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.8.5-1: Cell specific test parameters for TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (Cell #1 and Cell #2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group	
BWchannel		5MHz: NRB = 25 10MHz: NRB = 50		5MHz: NRB,= 25 10MHz: NRB,= 50	
Special subframe configuration Note1		6			
Uplink-downlink configuration Note1		1			
PDSCH parameters: DL Reference Measurement Channel As specified in clause A.3.1.1.2		5MHz: R.4 TDD 10MHz:R.0 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel As specified in clause A.3.1.2.2		5MHz: R.11 TDD 10MHz:R.6 TDD		5MHz: R.11 TDD 10MHz:R.6 TDD	
OCNG Patterns defined in A.3.2.2.1, A.3.2.2.2 ,A.3.2.2.9 and A.3.2.2.10		5MHz: OP.9 TDD 10MHz:OP.1 TDD		5MHz: OP.10.TDD 10MHz:OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 2	dB				
OCNG_RB Note 2	dB				
N_{oc} Note 4	dBm/15 kHz	-98		-98	

$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$ Note 5	dB	4	4	-Infinity	7
RSRP Note 5	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 5	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 4	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-64.76 +10log ($N_{RB,c}$ /50)	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Antenna Configuration		1x2		1x2	
Timing offset to Cell 1		-		3 μs	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 5: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.8.5-2: Cell specific test parameters for TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (Cell #3, Cell #4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 5,6,7,8,9 such that cell 3 is in the reduced performance group		Randomly selected from 5,6,7,8,9 such that cell 4 is in the reduced performance group. Cell 4 RF channel is different from Cell 3 RF channel.	
$BW_{channel}$		5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Special subframe configuration Note1		6			
Uplink-downlink configuration Note1		1			
PDSCH parameters: DL Reference Measurement Channel As specified in clause A.3.1.1.2		-		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel As specified in clause A.3.1.2.2		5MHz: R.11 TDD 10MHz:R.6 TDD		5MHz: R.11 TDD 10MHz:R.6 TDD	
OCNG Patterns defined in A.3.2.2.2 and A.3.2.2.10		5MHz: OP.10.TDD 10MHz:OP.2 TDD		5MHz: OP.10.TDD 10MHz:OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 2	dB				
OCNG_RB Note 2	dB				

N_{oc} Note 4	dBm/15 kHz	-98		-98 +TT	
$\hat{E}_s / N_{oc}$	dB	-Infinity	7	-Infinity	7
$\hat{E}_s / I_{ot}$ Note 5	dB	-Infinity	7	-Infinity	7
RSRP Note 5	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH_RP Note 5	dBm/15 kHz	-Infinity	-91	-Infinity	-91
Io Note 5	dBm/Ch BW	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)	-70.22 +10log ($N_{RB,c}$ /50)	-62.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN		AWGN	
Antenna Configuration		1x2		1x2	
Timing offset to Cell 1		3 µs		3 µs	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 5: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.17s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.4.9 TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX

8.4.9.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX. This test will partly verify the TDD-TDD inter-frequency cell search requirements for increased UE carrier monitoring in clause 8.1.2.3.

8.4.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports increased number of carrier monitoring. Applicability requires support for FGI bit 5.

8.4.9.3 Minimum conformance requirements

The test parameters are given in Tables 8.4.9.3-1, 8.4.9.3-2, 8.4.9.4.1-1 and 8.4.9.5-2. In this test, there are four cells on different carrier frequencies and gap pattern configuration # 0 as defined in TS 36.133 [4] in Table 8.1.2.1-1 is provided.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used.

Table 8.4.9.3-1: *drx-Configuration* to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf160	
shortDRX	disable	
Note: For further information see clause 6.3.2 in TS 36.331.		

Table 8.4.9.3-2: *TimeAlignmentTimer* and *sr-ConfigIndex* Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment
TimeAlignmentTimer	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213..

When DRX cycle is 160ms, the delay requirement of cell identification and measurement period are specified in section 8.1.2.3.1.2 and Non DRX Requirements in clause 8.1.2.3.1.1 are applicable.

The requirement of inter frequency cell identification delay are specified as

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

$T_{Basic\_Identify\_inter}$ 480ms, See section 8.1.2.3.1.1

T_{Inter1} 60ms, See section 8.1.2.1

$N_{freq,n}$ and $N_{freq,r}$ 3 and 5 set in this test case.

K_n and K_r 8/7 and 8, See section 8.1.2.1.1a.

This gives 13165.7ms for cells 2 on normal carrier, and 153600ms for cell 3 and cell 4 on reduced carriers for Event A3 triggered measurement reporting delay. The test requirements allow 13.2s and 153.6s.

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] in the sub-clauses 9.1.3.1 and 9.1.3.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2, and the RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.17.3.1 and 9.1.17.3.2.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.4.9.

8.4.9.4 Test description

8.4.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.4.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.9.4.3.

5. There are nine E-UTRA TDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.9.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for IncMon with reduced performance group configured, DRX on

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration		Cell 1,2,3,4	Cell 1 uses E-UTRA RF channel number 1 Cells 2 are randomly selected to use different frequencies selected from E-UTRA frequencies 2, 3, 4. Cells 3, 4 are randomly selected to use different frequencies selected from E-UTRA frequencies 5, 6, 7, 8, 9.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2,3,4	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table 4.2-2
A3-Offset	dB	-5	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	
Scaling factor for reduced performance group		8	
T1	s	5	
T2	s	155	

8.4.9.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.4.9.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 13.2s (cell 2) and 153.6s (cell 3 and 4) the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the eight TDD carrier frequencies, according to table 8.4.9.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.9.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.9.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-10 (-5dB)	-5 is actual value in dB (-10 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.9.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.9.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.4.9.5 Test requirement

Tables 8.4.9.4.1-1 and 8.4.9.5-1 define the primary level settings including test tolerances for event triggered reporting with reduced performance group and DRX configured inter frequency tests.

Table 8.4.9.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group		Randomly selected from 5, 6, 7, 8, 9 such that cell 3 is in the reduced performance group		Randomly selected from 5, 6, 7, 8, 9 such that cell 4 is in the reduced performance group	
Channel Bandwidth ($BW_{channel}$)	MHz	5MHz: NRB = 25 10MHz: NRB = 50		5MHz: NRB,= 25 10MHz: NRB,= 50		5MHz: NRB = 25 10MHz: NRB = 50		5MHz: NRB,= 25 10MHz: NRB,= 50	
PDSCH parameters as specified in clause A.3.1.1.2		5MHz: R.4 TDD 10MHz: R.0 TDD		-		-		-	
PCFICH/PDCCH/ PHICH parameters as specified in clause A.3.1.2.2		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD	
OCNG Patterns defined in A.3.2.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD	
PBCH_RA	dB	0		0		0		0	
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA[Note 1]	dB								
OCNG_RB[Note 1]	dB								
N_{oc} Note 3	dBm/15 kHz	-98		-98		-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4	-Infinity	5	-Infinity	5
$\hat{E}_s / I_{ot}$ Note 4	dB	4	4	-Infinity	4	-Infinity	5	-Infinity	5
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-93	-Infinity	-93
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-93	-Infinity	-93
Io Note 4	dBm/Ch BW	-64.76+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)
Propagation Condition		AWGN		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2		1x2	
Time offset to cell1	μs	-		3		3		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: E_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.2s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.4.10

8.4.11

8.4.12 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA

8.4.12.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.4.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.4.12.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When no DRX is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify and measure a new detectable TDD inter frequency cell according to requirements in Table 8.13.2.6.3.1-1 when SCH Ês/Iot >= -6 dB, provided

- G=1, or
- r_{max}*G < 80ms, or
- UE is receiving PDSCH.

Otherwise, requirements in Table 8.13.2.6.3.1-3 apply, where r_{max} and G are given by higher layer parameter *mPDCCH-NumRepetition* and *mPDCCH-startSF-UESS* respectively as defined in TS 36.213 [3].

Table 8.13.2.6.3.1-1: Requirement on cell identification delay and measurement delay for TDD interfrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1\_NC}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1\_NC}$)
0	1.44* $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	480* $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	2.88* $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	960* $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms

$$K_{inter\_M1\_NC} = \frac{N_{freq} * 100}{(100 - X)}$$

where X is signalled by the RRC parameter *measGapSharingScheme* [2] and is defined as in Table 8.13.2.6.3.1-2 when *highSpeedMeasGapCE-ModeA* [2] is not configured, and in Table 8.13.2.6.3.1-2A when *highSpeedMeasGapCE-ModeA* [2] is configured. N_{freq} is total number of inter-frequency layers to be monitored as defined in 8.1.2.1.1.

Table 8.13.2.6.3.1-2: Value of parameter X for CEModeA

measGapSharingScheme	Value of X (%)
'00'	$\frac{100}{N_{freq}+1}$
'01'	40
'10'	50
'11'	60

Table 8.13.2.6.3.1-2A: Value of parameter X for CEModeA for UE configured with *highSpeedMeasGapCE-ModeA*

measGapSharingScheme	Value of X (%)
'00'	$[\frac{100}{N_{freq}+1}]$
'01'	[50]
'10'	[80]
'11'	[90]

Table 8.13.2.6.3.1-3: Requirement on cell identification delay and measurement delay for TDD interfrequency cell with MPDCCH scaling

Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1}$)
0	Max(20 * r_{max}*G / 1000, 1.44) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 480) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms
1	Max(20 * r_{max}*G / 1000, 2.88) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ seconds	Max(5 * r_{max}*G, 960) * $K_{inter\_M1\_NC}$ * $K_{RSTD\_M1\_NC}$ ms

$$K_{RSTD\_M1\_NC} = \frac{1}{1 - \max(\frac{40}{T_{PRS}}, \frac{N_{PRS}}{T_{PRS}})}$$

$K_{RSTD\_M1\_NC}$ is applicable provided following conditions are met:

- T_{PRS} > 40 ms
- T_{PRS} > N_{PRS}

where

- T_{PRS} is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],
- N_{PRS} is the number of consecutive downlink positioning subframes in a positioning occasion defined in TS 36.211

Otherwise $K_{RSTD\_M1\_NC}$ = 1.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.9 and 9.1.21.10 are fulfilled for a corresponding Band,

- RSRQ related side conditions given in Clause 9.1.21.13 and 9.1.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.14-1 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ to higher layers with measurement accuracy as specified in sub-clauses 9.1.21.9, 9.1.21.10, 9.1.21.13 and 9.1.21.14 with measurement period ($T_{measure\_inter\_UE\ cat\ M1\_NC}$) given by table 8.13.2.6.3.1-1:

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_NC}$.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.9, 9.1.21.10, 9.1.21.13 and 9.1.21.14.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter\_UE\ cat\ M1\_NC}$ defined in Clause 8.13.2.6.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_UE\ cat\ M1\_NC}$ defined in clause 8.13.2.6.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter\_UE\ cat\ M1\_NC}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.3.1and A.8.4.12.

8.4.12.4 Test description

8.4.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.4.12.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.4.12.4.3.
5. There is two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.12.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
Rmax			8	As defined in *mPDCCH-NumRepetition* in [3]
G			10	As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme10	As defined in *measGapSharingScheme* in [3]
T1		S	5	
T2		S	5	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells

8.4.12.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.4.12.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.12.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3.2 s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.12.4.1-1 as appropriate.

8.4.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.4.12.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7

Table 8.4.12.4.3-2: *MeasConfig:* Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme10		
}			
}			

Table 8.4.12.4.3-3: *ReportConfig-A3*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.12.4.3-4: *MeasurementReport*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.4.12.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN TDD-TDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v10		
}			
mpdcch-NumRepetition-r13	r8		
}			
}			

8.4.12.5 Test requirement

Table 8.4.12.5-1 defines the configuration and primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.4.12.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE with discontinuous MPDCCH monitoring in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	8.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	-61.01
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3.2 s from the beginning of time period T2. During the test, downlink traffic is continuously scheduled.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.13 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB

8.4.13.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.4.13.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.4.13.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL/CE UEs. Pending discussion in RAN4 is needed to update the wording.

When no DRX is in use and when measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify and measure a new detectable TDD inter frequency cell according to requirements in Table 8.13.3.5.3.1-1 when additional condition in Table 8.13.3.5.3.1-1 is met, and

- G=1, or
- r_{max}*G < 800ms, or
- UE is receiving PDSCH.

Otherwise, requirements in Table 8.13.3.5.3.1-3 apply, where r_{max} and G are given by higher layer parameter *mPDCCH-NumRepetition* and *mPDCCH-startSF-UESS* respectively as defined in TS 36.213 [3].

Table 8.13.3.5.3.1-1: Requirement on cell identification delay and measurement delay for TDD interfrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$) for neighbouring cell SCH Ês/Iot (Q): -15≤ Q2 < -6 [dB]	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤ Q2 < -6	0	320.8 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ S	800 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms Note1 [1600 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms] Note2
	1	321.6 * $K_{inter\_M1\_EC}$ S	1600 * $K_{inter\_M1\_EC}$ ms Note1 [3200 * $K_{inter\_M1\_EC}$ ms] Note2
Q2≥-6	0	21.8 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ S	800 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms Note1 [1600 * $K_{inter\_M1\_EC}$ * $K_{RSTD\_M1\_EC}$ ms] Note2
	1	22.6 * $K_{inter\_M1\_EC}$ S	1600 * $K_{inter\_M1\_EC}$ ms Note1 [3200 * $K_{inter\_M1\_EC}$ ms] Note2
Note 1: Under TDD UL/DL configuration other than 0. Note 2: Under TDD UL/DL configuration 0.			

$$K_{inter\_M1\_EC} = \frac{N_{freq} * 100}{(100 - X)}$$

where X is signalled by the RRC parameter *measGapSharingScheme* and is defined as in Table 8.13.3.5.3.1-2. N_{freq} is total number of inter-frequency layers to be monitored as defined in 8.1.2.1.1.

Table 8.13.3.5.3.1-2: Value of parameter X for CEModeB

measGapSharingScheme	Value of X (%)
'00'	$\frac{100}{N_{freq}+1}$
'01'	50
'10'	75
'11'	87.5

Table 8.13.3.5.3.1-3: Requirement on cell identification delay and measurement delay for TDD interfrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	Cell identification delay ($T_{identify\_inter\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_inter\_UE\ cat\ M1}$)
-15≤ Q2 < -6	0	Max(400 * r_{max}* G / 1000, 320.8) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 800) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms Note1 [Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms] Note2
	1	Max(400 * r_{max}* G / 1000, 321.6) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms Note1 [Max(5 * r_{max}* G, 3200) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms] Note2
Q2≥-6	0	Max(20 * r_{max}* G / 1000, 21.8)* $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 800) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms Note1 [Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms] Note2
	1	Max(20 * r_{max}* G / 1000, 22.6)* $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ s	Max(5 * r_{max}* G, 1600) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms Note1 [Max(5 * r_{max}* G, 3200) * $K_{inter\_M1\_EC}$* $K_{RSTD\_M1\_EC}$ ms] Note2
Note1: Under TDD UL/DL configuration other than 0. Note2: Under TDD UL/DL configuration 0.			

$$K_{RSTD\_M1\_EC} = \frac{1}{1 - \max(\frac{40}{T_{PRS}}, \frac{N_{PRS}}{T_{PRS}})}$$

$K_{RSTD\_M1\_NC}$ is applicable provided following conditions are met:

- T_{PRS} > 40 ms
- T_{PRS} > N_{PRS}

where

- T_{PRS} is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],
- N_{PRS} is the number of consecutive downlink positioning subframes in a positioning occasion defined in TS 36.211

Otherwise $K_{RSTD\_M1\_EC}$ = 1.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.11 and 9.1.21.12 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.15 and 9.1.21.16 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.16-1 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ to higher layers with measurement accuracy as specified in sub-clauses 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16 with measurement period ($T_{measure\_inter\_UE\ cat\ M1\_EC}$) given by table 8.13.3.5.3.1-1:

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_EC}$.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: *pusch-maxNumRepetitionCEmodeB* x TTI_{DCCH}, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured for the UE in CE Mode B provided that *pusch-maxNumRepetitionCEmodeB >1*, otherwise uncertainty is defined as 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter\_UE\ cat\ M1\_EC}$ defined in Clause 8.13.3.5.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_UE\ cat\ M1\_EC}$ defined in clause 8.13.3.5.3.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter\_UE\ cat\ M1\_EC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.5.3.1 and A.8.4.13.

8.4.13.4 Test description

8.4.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.4.13.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.4.13.4.3.
5. There is two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.13.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
Rmax			128	As defined in *mPDCCH-NumRepetition* in [3]
G			8	As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme01	As defined in *measGapSharingScheme* in [3]
T1		S	5	
T2		S	≤825	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells

8.4.13.4.2 Test procedure

The same test procedure as in 8.4.12.4.2 with the following exception in step 6.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 819.2 s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

8.4.13.4.3 Message contents

The same message content as in 8.4.12.4.3 with the following exception:

Instead of CEModaA use CEModeB.

Table 8.4.13.4.3-1: *MeasConfig:* Additional E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measGapSharingConfig-r14 ENUMERATED {	scheme01		
}			
}			

8.4.13.5 Test requirement

Table 8.4.13.5-1 defines the configuration and primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.4.13.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE with discontinuous MPDCCH monitoring in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.19 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 TDD		R.17 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 819.2 s from the beginning of time period T2, which is derived from section 8.13.3.5.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to *pusch-maxNumRepetitionCEmodeB* x TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured

8.4.14 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used

8.4.14.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.4.14.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.4.14.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use and when DRX or eDRX_CONN is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable TDD inter frequency cell within $T_{identify\_inter\_UE\ catM1}$ as shown in table 8.13.2.6.3.2-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable TDD inter frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_NC}$ as shown in table 8.13.2.6.3.2-1A.

Table 8.13.2.6.3.2-1: Requirement to identify a newly detectable TDD interfrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	≤0.04	1.44* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.04<DRX-cycle≤0.08	Note 2 (40* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128	3.2* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (25* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(20* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	<0.128	2.88* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.128	3.2* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (25* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
	0.128<DRX-cycle≤2.56	Note 2(20* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.3.2-1A: Requirement to identify a newly detectable TDD interfrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.21.9 and 9.1.21.10 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.13 and 9.1.21.14 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.14-1 for a corresponding Band

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_NC}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is in use, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.3.2-2, and when eDRX_CONN is in use, $T_{measure\_inter\_UE\ cat\ M1\_NC}$ is as defined in Table 8.13.2.6.3.2-3.

Table 8.13.2.6.3.2-2: Requirement to measure TDD inter frequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (DRX cycles)
0	<0.128	0.48* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.128≤DRX-cycle≤2.56	Note 2 (5* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
1	<0.256	0.96* K_{inter_M1} * $K_{RSTD\_M1\_NC}$ (Note 1)
	0.256≤DRX-cycle≤2.56	Note 2 (5* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use		

Table 8.13.2.6.3.2-3: Requirement to measure TDD inter frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_NC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5* K_{inter_M1} * $K_{RSTD\_M1\_NC}$)
Note: Time depends upon the eDRX_CONN cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.9 and 9.1.21.10.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.13 and 9.1.21.14.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.9, 9.1.21.10, 9.1.21.13 and 9.1.21.14.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_UE\ cat\ M1\_NC}$ defined in Clause 8.13.2.6.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_UE\ cat\ M1\_NC}$ defined in clause 8.13.2.6.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_inter\_UE\ cat\ M1\_NC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.6.3.2and A.8.4.14.

8.4.14.4 Test description

8.4.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.4.14.4.1-1.

3. Propagation conditions are set according to Annex B.0.

4. Message contents are defined in clause 8.4.14.4.3.

5. There is two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.14.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA in DRX

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1, 2		
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		
A3	Offset	dB	-6		
	Hysteresis	dB	0		
	Time To Trigger	S	0		
Filter coefficient			0		L3 filtering is not used
Gap pattern ID			0		
Rmax			8		As defined in *mPDCCH-NumRepetition* in [3]
G			1		As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme10		As defined in *measGapSharingScheme* in [3]
T1		S	5		
T2		S	10	60	
Special subframe configuration			6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells

8.4.14.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Table 8.4.14.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.14.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 6.4 s for Test 1 and less than 51.2 s for the Test 2 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF CE according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.14.4.1-1 as appropriate.

8.4.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.4.14.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeA in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.7.1-1

Table 8.4.14.4.3-2: *MeasConfig:* Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfig-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f1		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapSharingConfig-r14 ENUMERATED {	scheme10		
}			
}			

Table 8.4.14.4.3-3: *ReportConfig-A3*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.14.4.3-4: *MeasurementReport*: Additional E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX test requirement

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {			
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
}			
}			
}			
}			
}			

Table 8.4.14.4.3-5: *MPDCCH-Config-r13-DEFAULT:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v10		
}			
mpdcch-NumRepetition-r13	r8		
}			
}			

Table 8.4.14.4.3-6: *drx-Config:* Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf128	0		Test 1
sf1280	0		Test 2
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.4.14.4.3-7: SchedulingRequest-Config: Additional E-UTRAN FDD-FDD inter-frequency event triggered under fading propagation conditions for CE UE in CEModeA in drx test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3 Table 4.6.3-20			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-ConfigIndex	2		
}			
}			

8.4.14.5 Test requirement

Table 8.4.14.5-1, 8.4.14.5-2 and 8.4.14.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.4.14.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	8.65
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4	-Infinity	8.65
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-89.35
Io Note 3	dBm/9MHz	-64.76	-64.76	-Infinity	-61.01
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.4.14.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	disable	disable	

Table 8.4.14.5-3: TimeAlignmentTimer-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA in DRX

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6.4 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 51.2 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

8.4.15 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used

8.4.15.1 Test purpose

To verify the CE UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.4.15.2 Test applicability

This test applies to all types of E-UTRA FD-FDD CE UE, including both BL/CE and non-BL/CE UE.

8.4.15.3 Minimum conformance requirements

Editor's note: The test requirements in this section refer explicitly to Category M1, but they are also applicable to Category M2 and non-BL CE UEs. Pending discussion in RAN4 is needed to update the wording.

When DRX is in use and when DRX or eDRX_CONN is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable TDD inter frequency cell within $T_{identify\_inter\_UE\ catM1}$ as shown in table 8.13.3.5.3.2-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable TDD inter frequency cell within $T_{identify\_inter\_UE\ cat\ M1\_EC}$ as shown in table 8.13.3.5.3.2-1.

Table 8.13.3.5.3.2-1: Requirement to identify a newly detectable TDD interfrequency cell

Neighbouring cell SCH Ês/Iot: Q2 [dB]	Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
-15≤ Q2 < -6	0	≤0.64	320.8 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(400 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	321.6 * K_{inter_M1} (Note1)
		0.64< DRX-cycle≤2.56	Note2(400 * K_{inter_M1})
Q2≥-6	0	≤0.64	21.8 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
		0.64< DRX-cycle≤2.56	Note2(24 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
	1	DRX-cycle ≤ 0.640	22.6 * K_{inter_M1} (Note1)
		0.64< DRX-cycle≤2.56	Note2(24 * K_{inter_M1})
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use			

Table 8.13.3.5.3.2-1A: Requirement to identify a newly detectable TDD interfrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_inter\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (400 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.21.11 and 9.1.21.12 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.21.15 and 9.1.21.16 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.16-1 for a corresponding Band

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{measure\_inter\_UE\ cat\ M1\_EC}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is in use, $T_{measure\_inter\_UE\ cat\ M1\_EC}$ is as defined in Table 8.13.3.5.3.2-2, and when eDRX_CONN is in use, $T_{measure\_inter\_UE\ cat\ M1\_EC}$ is as defined in Table 8.13.3.5.3.2-2.

Table 8.13.3.5.3.2-2: Requirement to measure TDD inter frequency cells

Neighbouring cell SCH Ês/Iot: Q2 [dB]	TDD Uplink-downlink configuration	Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
Q2≥-15	Other than 0	0	≤0.16	0.8 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$ (Note1)
			0.16<DRX-cycle≤2.56	Note2(5 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
		1	≤0.32	1.6 * K_{inter_M1} (Note1)
			0.32<DRX-cycle≤2.56	Note2(5 * K_{inter_M1})
	0	0	≤0.32	[1.6 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$] (Note1)
			0.32<DRX-cycle≤2.56	Note2(5 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
		1	≤0.64	[3.2 * K_{inter_M1}] (Note1)
			0.64<DRX-cycle≤2.56	Note2(5) * K_{inter_M1}
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.				

Table 8.13.3.5.3.2-3: Requirement to measure TDD inter frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_inter\_UE\ cat\ M1\_EC}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5 * K_{inter_M1} * $K_{RSTD\_M1\_EC}$)
Note: Time depends upon the eDRX_CONN cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.11 and 9.1.21.12.

The RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.15 and 9.1.21.16.

The requirements in this subclause apply regardless of MPDCCH monitoring configuration.

8.13.3.5.3.2.1 Measurement Reporting Requirements

8.13.3.5.3.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16.

8.13.3.5.3.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.5.3.2.1.3.

Reported RSRP and RSRQ measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.11, 9.1.21.12, 9.1.21.15 and 9.1.21.16.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: *pusch-maxNumRepetitionCEmodeB* x TTI_{DCCH}, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured for the UE in CE Mode B provided that *pusch-maxNumRepetitionCEmodeB >1*, otherwise uncertainty is defined as 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_UE\ cat\ M1\_EC}$ defined in Clause 8.13.3.5.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_UE\ cat\ M1\_EC}$ defined in clause 8.13.3.5.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_inter\_UE\ cat\ M1\_EC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.5.3.2 and A.8.4.15.

8.4.15.4 Test description

8.4.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.4.15.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.4.15.4.3.
5. There is two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.15.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions for CE UE in CEModeB in DRX

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1, 2		
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		
A3	Offset	dB	-8		
	Hysteresis	dB	0		
	Time To Trigger	S	0		
Filter coefficient			0		L3 filtering is not used
Gap pattern ID			0		
Rmax			8		As defined in *mPDCCH-NumRepetition* in [3]
G			1		As defined in *mPDCCH-startSF-UESS* in [3]
X			scheme01		As defined in *measGapSharingScheme* in [3]
T1		S	5		
T2		S	≤650	≤1050	
Special subframe configuration			6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells

8.4.15.4.2 Test procedure

The same test procedure as in 8.4.12.4.2 with the following exception in step 6.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 641.6 s for Test 1 and less than 1024 s for the Test 2 the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

8.4.15.4.3 Message contents

The same message content as in 8.4.15.4.3 with the following exception:

Instead of CEModaA use CEModeB.

Table 8.4.15.4.3-1: *MeasConfig:* Additional E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measGapSharingConfig-r14 ENUMERATED {	scheme01		
}			
}			

8.4.15.5 Test requirement

Table 8.4.15.5-1, 8.4.15.5-2 and 8.4.15.5-3 define the configuration and primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting for serving cell under fading propagation conditions test.

Table 8.4.15.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
PDSCH parameters: DL Reference Measurement Channel		R.19 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 TDD		R.17 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98		-98	
$\hat{E}_s / N_{oc}$	dB	-12	-12	-Infinity	-8.35
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	-12	-Infinity	-8.35
RSRP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
SCH_RP Note 3	dBm/15 KHz	-110	-110	-Infinity	-106.35
Io Note 3	dBm/9MHz	-69.95	-69.95	-Infinity	-69.39
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.4.15.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf128	sf1280	
shortDRX	disable	disable	

Table 8.4.15.5-3: TimeAlignmentTimer-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeB in DRX

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 641.6 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1024 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with confidence level of 95%..

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

8.5 E-UTRAN FDD - UTRAN measurements

8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.5.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 15 and 22.

8.5.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurement\ UTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay

uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.1.

8.5.1.4 Test description

8.5.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.5.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.1.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.1.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to Cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.

T1	s	5	
T2	s	6	

8.5.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.5.1.5-1 and 8.5.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.1.5-1 and 8.5.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.5.1.5 Test requirement

Tables 8.5.1.4.1-1, 8.5.1.5-1 and 8.5.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (Cell 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.5.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions

8.5.2.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN FDD - UTRAN FDD cell search requirements for identification of a new UTRA FDD cell for SON given in TS 36.133 [4] section 8.1.2.4.7.1.1.

8.5.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 5, 19 and 22.

8.5.2.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{Tinter1} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify,\ UTRA\_FDD}$ ms, the UE may stop searching UTRA cells for SON.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.7 and A.8.5.2.

8.5.2.4 Test description

8.5.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 8.5.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.5.2.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.2.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	6	

8.5.2.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.5.2.5-1 and 8.5.2.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

4. SS shall transmit an RRCConnectionReconfiguration message.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.5.2.5-1 and 8.5.2.5-2.

7. The UE shall transmit a MeasurementReport message containing the primary scrambling code of cell 2. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.2.4.3-1: Common Exception messages for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.5.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod	2 entry		
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF ReportConfigToAddMod	1 entry		
ReportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of MeasIdToAddMod	1 entry		
MeasIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.2.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellsForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	1		
}			

Table 8.5.2.4.3-4: *MeasResults*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.2.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	The primary scrambling code, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			
}			
}			

8.5.2.5 Test requirement

Tables 8.5.2.4.1-1, 8.5.2.5-1 and 8.5.2.5-2 define the primary level settings including test tolerances for UTRAN FDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.5.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.5.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-2.95
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14.73
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{Tinter1} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90% with a confidence level of 95%.

8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

8.5.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 5, 15 and 22.

8.5.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within Tidentify, UTRA_FDD as in table 8.5.3.3-1.

Table 8.5.3.3-1: Requirements to identify a newly detectable UTRA FDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	2.56* Nfreq (40* Nfreq)	4.8* Nfreq (75* Nfreq)
0.08	3.2* Nfreq (40* Nfreq)	4.8* Nfreq (60* Nfreq)
0.128	3.2* Nfreq (25* Nfreq)	4.8* Nfreq (37.5* Nfreq)
0.16	3.2* Nfreq (20* Nfreq)	4.8* Nfreq (30* Nfreq)
0.16<DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier and the UE physical layer shall be capable of reporting RSCP and Ec/Io measurements to higher layers with the measurement period defined in table 8.5.3.3-2.

Table 8.5.3.3-2: Requirements to measure UTRA FDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	**Gap period = 80 ms**
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	0.48* N_{freq} (7.5* N_{freq})	0.8* N_{freq} (12.5* N_{freq})
0.08	0.48* N_{freq} (6* N_{freq})	0.8* N_{freq} (10* N_{freq})
0.128	0.64* N_{freq} (5* N_{freq})	0.8* N_{freq} (6.25* N_{freq})
0.128<DRX-cycle≤2.56	Note (5* N_{freq})	Note (5* N_{freq})
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1.2 and A.8.5.3.

8.5.3.4 Test description

8.5.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.5.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.3.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.3.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on UTRA RF channel number 1.
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io		
b1-Threshold-UTRA	dB	-18		CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.5.3.5-2
Monitored UTRA FDD cell list size		12		UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5		
T2	s	6	30	

8.5.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.5.3.5-1, 8.5.3.5-2, 8.5.3.5-3 and 8.5.3.5-5. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.3.5-1 and 8.5.3.5-4. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 2442 ms for Test 1 or less than 26882 ms for Test 2 then the number of

successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-4 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.5.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.5.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0(0 dB)		
}			
}			
}			

Table 8.5.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.5.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.3.4.3-6: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 8.5.3.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.5.3.5 Test requirement

Tables 8.5.3.4.1-1, 8.5.3.5-1 and 8.5.3.5-4 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.5.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.5.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.5.3.5-4: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delays measured when DRX cycle length is 40 ms in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$=

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 2442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_FDD}$

$T_{identify\_UTRA\_FDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_FDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

8.5.4.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN cells. This test will partly verify the Enhanced UTRA FDD cell identification requirements in section 8.1.2.4.1.1.1a.

8.5.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD. Applicability requires support for FGI bit 15.

8.5.4.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length ≤ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\ enhanced\_UTRA\_FDD}$:

$$T_{identify,\ enhanced\_UTRA\_FDD} = (T_{basic\_identify\_enhanced\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} + 480)\ N_{Freq} \quad ms$$

A cell shall be considered detectable when:

- CPICH Ec/Io ≥ -15 dB,
- SCH_Ec/Io ≥ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1.1.1a and A.8.5.4.

8.5.4.4 Test description

8.5.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.5.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.4.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN FDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.5.4.4.1-1: General test parameters for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	s	5	
T2	s	2	

8.5.4.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.5.4.5-1 and 8.5.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with Event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.5.4.5-1 and 8.5.4.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 962 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.4.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.4.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	UTRA-Thres is actual Ec/No value in dB (UTRA-Thres * 2 + 49)	UTRA-FDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.5.4.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.4.4.3-4: *MeasResultListUTRA*: E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test INTEGER (0..49)	
}			
}			

8.5.4.5 Test requirement

Tables 8.5.4.4.1-1, 8.5.4.5-1 and 8.5.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions test.

Table 8.5.4.5-1: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.5.4.5-2: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	- infinity	0.02
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	- infinity	-13
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send the first measurement report containing the primary scrambling code of cell 2.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ enhanced\_UTRA\_FDD}$

$$T_{identify,\ enhanced\_UTRA\_FDD} = (T_{basic\_identify\_enhanced\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} + 480)\ N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 60 ms. It is defined in TS 36.133 [4] section 8.1.2.1.

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 962 ms in this test case (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.5

FFS

8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

8.5.6.1 Test purpose

To verify the UE's ability to make a correct reporting of an event without measurement gaps within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support UTRA FDD with support of Measurement without gaps. Applicability requires support for FGI bits 15 and 22.

8.5.6.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,

- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

$X_{basic\ measurement\ UTRA\_FDD} = 6$

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period $T_{measurement\_UTRA\_FDD}$ for UTRA FDD CPICH measurements.

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] clause 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] clause 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

N_{freq} is defined in clause 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] clause 8.1.2.1

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.6.

8.5.6.4 Test description

8.5.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.5.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.6.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.6.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.3 FDD	As specified in clause A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.5.6.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.5.6.5-1 and 8.5.6.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.6.5-1 and 8.5.6.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms and at least 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator until the measurement report is received during T2 the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.6.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.5.6.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.6.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.6.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 8.5.6.4.3-5: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.6.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.5.6.5 Test requirement

Tables 8.5.6.4.1-1, 8.5.6.5-1 and 8.5.6.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions test.

Table 8.5.6.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.10 (OP.10 FDD)		OP.10 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.5.6.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event A3 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth

8.5.7.1 Test purpose

Same test purpose as defined in clause 8.5.1.1.

8.5.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD and only support E-UTRA bands within band group FDD_N. Applicability requires support for FGI bits 15 and 22.

8.5.7.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.5.1.3 with the following exceptions:

- Instead of A.8.5.1 → use A.8.5.7.

8.5.7.4 Test description

8.5.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.5.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.5.7.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.7.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1.
E-UTRA Channel Bandwidth (BWchannel)	MHz	5	
NOTE 1: See Table 8.5.1.4.1-1 for the other parameters. NOTE 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

8.5.7.4.2 Test procedure

Same test procedure as defined in clause 8.5.1.4.2 with the following exceptions:

- Instead of Table 8.5.1.5-1 → use Table 8.5.7.5-1.

8.5.7.4.3 Message contents

Same message contents as defined in clause 8.5.1.4.3.

8.5.7.5 Test requirement

Same test requirement as defined in clause 8.5.1.5 with the following exceptions:

Tables 8.5.7.4.1-1, 8.5.7.5-1 and 8.5.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells for 5MHz bandwidth test.

Table 8.5.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (Cell 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	5	
OCNG Pattern defined in D.1.15		OP.15 FDD	
NOTE: See Table 8.5.1.5-1 for the other parameters.			

8.5.8 E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX

8.5.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event B1. This test will partly verify the E-UTRA FDD-UTRA FDD inter-RAT cell search requirements for increased carrier monitoring UTRA with reduced performance group configured, non DRX given in TS 36.133 [4] in clause 8.1.2.4.1.

8.5.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support increased carrier monitoring UTRA. Applicability requires support for FGI bits 15 and 22.

8.5.8.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n} \quad ms \text{ (normal performance),}$$

and

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r} \quad ms \text{ (reduced performance)}$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.2 with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \text{ (normal}$$

performance),

and

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \text{ (reduced}$$

performance)

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.8.

8.5.8.4 Test description

8.5.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.5.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.8.4.3.

5. There is one E-UTRA FDD serving cell and six UTRA FDD frequencies defined and total four cells specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, 3, 4 (UTRA FFD cells) are chosen randomly from given 6 defined UTRA frequencies such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table 8.5.8.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1	Serving cell and six UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE is configured UTRA RF channel numbers		2, 3, 4, 5, 6, 7	
Test equipment configuration		Cell 1 uses E-UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7	Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Correlation Matrix and Antenna Configuration		1x2 low	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Time offset with respect to cell1		0	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor for reduced performance group		16	
T1	s	5	
T2	s	155	

8.5.8.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 6 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.5.8.5-1 and 8.5.8.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.8.5-1 and 8.5.1.8-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1 for cells 2, 3 and 4. If the overall delay measured from the beginning of time period T2 is less than 7.68s (cell 2) and 115,2s (cell 3 and 4) then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cells 2, 3 and 4 primary scrambling code = ((current primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the six UTRA FDD carrier frequencies, according to Table 8.5.8.4-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.8.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.8.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.8.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId		Set according to specific test	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.8.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd		Set according to specific test	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.5.8.5 Test requirement

Tables 8.5.8.4.1-1 and 8.5.8.5-1 and 8.5.8.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX.

Table 8.5.8.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98+TT	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.5.8.5-2: Cell specific test parameters for UTRAN FDD (cell # 2, 3 and 4) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Cells 2 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7		Cells 3 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7		Cells 4 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7	
CPICH_Ec/Ior	dB	-10					
PCCPCH_Ec/Ior	dB	-12					
SCH_Ec/Ior	dB	-12					
PICH_Ec/Ior	dB	-15					
DPCH_Ec/Ior	dB	N/A					
OCNS		-0.941					
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8	-infinity	-1.8	-infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70+TT					
CPICH_Ec/Io	dB	-infinity	-14	-infinity	-14	-infinity	-14
Propagation Conditions		Case 5 (Note 3)					

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 7.68s (cell 2) and 115,2s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.6 E-UTRAN TDD - UTRAN FDD measurements

8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.6.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA FDD cell search requirements.

8.6.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 15 and 22.

8.6.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify, UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA\_FDD}} = T_{\text{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{\text{measurement\_UTRA\_FDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_FDD}}, T_{\text{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurement\ UTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.2 and A.8.6.1.

8.6.1.4 Test description

8.6.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.6.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.6.1.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.6.1.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.6.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.6.1.5-1 and 8.6.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2.. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.6.1.5-1 and 8.6.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.6.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.6.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0dB)		
}			
}			

Table 8.6.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServiCCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	UTRA-FDD-CellIdentity		
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.6.1.5 Test requirement

Tables 8.6.1.4.1-1, 8.6.1.5-1 and 8.6.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.6.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		

OCNG_RB[Note 1]	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.6.1.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.6.2

8.6.3 E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX

8.6.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event B1. This test will partly verify the E-UTRA TDD-UTRA FDD inter-RAT cell search requirements for increased carrier monitoring UTRA with reduced performance group configured, non DRX given in TS 36.133 [4] in clause 8.1.2.4.1.

8.6.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that support increased carrier monitoring UTRA. Applicability requires support for FGI bits 15 and 22.

8.6.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n} \quad ms \text{ (normal performance),}$$

and

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r} \quad ms \text{ (reduced performance)}$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.2 with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \text{ (normal performance),}$$

and

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \text{ (reduced performance)}$$

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.6.3.

8.6.3.4 Test description

8.6.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.6.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.6.3.4.3.

5. There is one E-UTRA TDD serving cell and six UTRA FDD frequencies defined and total four cells specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, 3, 4 (UTRA FFD cells) are chosen randomly from given 6 defined UTRA frequencies such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table 8.6.3.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1	Serving cell and seven UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE is configured UTRA RF channel numbers		2, 3, 4, 5, 6, 7,8	
Test equipment configuration		Cell 1 uses E-UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7,8	Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Correlation Matrix and Antenna Configuration		1x2 low	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to cell 1
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. Applicable to cell 1
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor for reduced performance group		16	
T1	s	5	
T2	s	155	

8.6.3.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.6.3.5-1 and 8.6.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.6.3.5-1 and 8.6.3.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1 for cells 2, 3 and 4. If the overall delay measured from the beginning of time period T2 is less than 7.68s (cell 2) and 115,2s (cell 3 and 4) then the

number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cells 2, 3 and 4 primary scrambling code = ((current primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the six UTRA FDD carrier frequencies, according to Table 8.6.3.4-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.6.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.6.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.6.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.6.3.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId		Set according to specific test	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.6.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd		Set according to specific test	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.6.3.5 Test requirement

Tables 8.6.3.4.1-1 and 8.6.3.5-1 and 8.6.3.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX.

Table 8.6.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98+TT	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.6.3.5-2: Cell specific test parameters for UTRAN FDD (cell # 2, 3 and 4) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Cells 2 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7		Cells 3 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7		Cells 4 is randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7	
CPICH_Ec/Ior	dB	-10					
PCCPCH_Ec/Ior	dB	-12					
SCH_Ec/Ior	dB	-12					
PICH_Ec/Ior	dB	-15					
DPCH_Ec/Ior	dB	N/A					
OCNS		-0.941					
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8	-infinity	-1.8	-infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-infinity	-14	-infinity	-14	-infinity	-14
Propagation Conditions		Case 5 (Note 3)					
Notes TBD							

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 7.68s (cell 2) and 115,2s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.7 E-UTRAN TDD - UTRAN measurements

8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Editor's note: It only includes 1.28 Mcps TDD option related requirements

8.7.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA TDD cell search requirements.

8.7.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 that support UTRA TDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.7.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD}$.

$X_{basic\ measurementUTRA\_TDD} = 6$

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify, UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.7.1.

8.7.1.4 Test description

8.7.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.1.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.1.4.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	

8.7.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.7.1.5-1 and 8.7.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.1.5-1 and 8.7.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6402 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall change to set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	28	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.1.5 Test requirement

Tables 8.7.1.4.1-1, 8.7.1.5-1 and 8.7.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.7.1.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s / I_{ot}$	dB	9	9
$\hat{E}_s / N_{oc}$	dB	9	9
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-89	-89
SCH_RP	dBm/15kHz	-89	-89
Propagation Condition		ETU70	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.7.1.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions

Editor's note: It only includes 1.28 Mcps TDD option related requirements

8.7.2.1 Test purpose

The test cases are to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify E-UTRA TDD to UTRA TDD cell search requirements when DRX is used in TS 36.133 [4] section 8.1.2.4.3.2.

8.7.2.2 Test applicability

This test applies to all types of release 8 E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 5, 15 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 5, 15 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 5, 15 and 39.

8.7.2.3 Minimum conformance requirements

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify\_UTRA\_TDD}$ as shown in table 8.7.2.3-1

Table 8.7.2.3-1: Requirement to identify a newly detectable UTRA TDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.32	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable
0.32<DRX-cycle≤0.512	Note (20* Nfreq)	Note (25* Nfreq)
0.512<DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period defined in table 8.7.2.3-2.

Table 8.7.2.3-2: Requirement to measure UTRA TDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable
0.064	0.48*N_{freq} (7.5*N_{freq})	0.8*N_{freq} (12.5*N_{freq})
0.08	0.48*N_{freq} (6*N_{freq})	0.8*N_{freq} (10*N_{freq})
0.128	0.64*N_{freq} (5*N_{freq})	0.8*N_{freq} (6.25*N_{freq})
0.128<DRX-cycle≤2.56	Note (5*N_{freq})	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify, UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.2 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements TS 36.133 [4] in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.2.2 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.2 and A.8.7.2.

8.7.2.4 Test description

8.7.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.2.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.7.2.4.1-1: General test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Active cell		Cell 1		E-UTRAN TDD cell
Neighbour cell		Cell 2		UTRAN 1.28Mcps TDD cell
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
PRACH configuration		4		As specified in table 5.7.1-3 in 3GPP TS 36.211
CP length of cell 1		Normal		
Ofn	dB	0		
Thresh	dBm	-83		Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.7.2.5-3
Time offset between cells	ms	3		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	8	30	

8.7.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.7.2.5-1 and 8.7.2.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.2.5-1 and 8.7.2.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6442 ms for Test1 or less than 26882 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.7.2.4.1-1 as appropriate.

8.7.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.2.4.3-1: Common Exception messages for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-4 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.7.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.7.2.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
thresholdUTRA-RSCP	32	UTRA-Thres + 115 UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER (0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.7.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.2.4.3-6: *MeasResultListUTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	PhysCellIdUTRA-TDD INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

Table 8.7.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.7.2.5 Test requirement

The common test parameters are given in Tables 8.7.2.4.1-1, 8.7.2.5-1 and 8.7.2.5-2. DRX configuration for Test1 and Test2 are given in Table 8.7.2.5-3 and time alignment timer and scheduling request related parameters in Table 8.7.2.5-4.

Table 8.7.2.5-1: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		

$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc} Note 2	dBm/15kHz	-98	
RSRP Note 3	dBm/15kHz	-94	-94
SCH_RP Note 3	dBm/15kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.7.2.5-2: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or} / I_{oc}$	dB	-inf	9	-inf	9
I_{oc}	dBm/1.28 MHz	-80.40			
PCCPCH RSCP	dBm	-inf	-74.40	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

Table 8.7.2.5-3: drx-Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.7.2.5-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event B1 triggered the measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$=

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 6442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_TDD}$

$T_{identify\_UTRA\_TDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_TDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions

8.7.3.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN TDD cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN TDD - UTRAN TDD cell search requirements for identification of a new UTRA TDD cell for SON given in TS 36.133 [4] section 8.1.2.4.13.1.

8.7.3.2 Test applicability

This test applies to all types of release 8 E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 19 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 22 and 37.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 37 and 39.

8.7.3.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_TDD} = T_{basic\_identify\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA TDD cell for SON within $8*T_{identify,\ UTRA\_TDD}$ ms, the UE may stop searching UTRA TDD cells for SON.

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in section 8.1.2.4.13.1.1 in TS 36.133 [4] and in section 8.1.2.4.13.1.2 in TS 36.133 [4] for non DRX and DRX cases respectively. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.13 and A.8.7.3.

8.7.3.4 Test description

8.7.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.3.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.3.4.1-1: General test parameters for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	14	

8.7.3.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.7.3.5-1 and 8.7.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.7.3.5-1 and 8.7.3.5-2.

6. The UE shall transmit a MeasurementReport message containing the cell parameter id of cell 2. If the overall delays measured from the beginning of time period T2 is less than 12802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.3.4.3-1: Common Exception messages for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.7.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	f1 is the frequency of the serving cell (E-UTRA Cell)	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f2)	f2 is the frequency of the neighbouring cell (UTRA Cell)	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
ReportConfigToAddMod SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.7.3.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellsForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.7.3.4.3-4: *MeasResults*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	The cell parameter id, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

8.7.3.5 Test requirement

Tables 8.7.3.4.1-1, 8.7.3.5-1 and 8.7.3.5-2 define the primary level settings including test tolerances for UTRAN TDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.7.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.7.3.5-2: Cell specific test parameters for UTRAN TDD (cell # 2) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1		T2	
UTRA RF Channel number Note2		Channel 2			
DL timeslot number		0	DwPTS	0	DwPTS
PCCPCH_Ec/Ior	dB	-3		-3	
DwPCH_Ec/Ior	dB		0		0
OCNS_Ec/Ior	dB	-3		-3	
Îor/Ioc	dB	-Infinity		5	
PCCPCH RSCP Note1	dBm	-Infinity	n.a.	-73	n.a.
Io Note1	dBm/1.28MHz	-Infinity		-70.88	
Ioc	dBm/1.28MHz	-75			
Propagation condition		AWGN			

Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

The UE shall send the first measurement report containing the physical cell identity of cell 2, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_TDD} = T_{basic\_identify\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 30 ms. TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90% with a confidence level of 95%.

8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

8.7.4.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in TS 36.133 [4] section 8.1.2.4.3.1.1a under AWGN propagation conditions.

8.7.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.7.4.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length $\leq$ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\ enhanced\_UTRA\_TDD}$:

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 500 ms.

A cell shall be considered detectable when:

- P-CCPCH_Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB

When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.1.1a and A.8.7.4.

8.7.4.4 Test description

8.7.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.4.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.7.4.4.1-1: General test parameters for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	s	5	
T2	s	2	

8.7.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.7.4.5-1 and 8.7.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.7.4.5-1 and 8.7.4.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 1122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the *MeasurementReport* message in step 6) or when T2 expires, the SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.4.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7.4.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	32	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.4.4.3-4: *MeasResultListUTRA*: E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.4.5 Test requirement

Tables 8.7.4.4.1-1, 8.7.4.5-1 and 8.7.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions test.

Table 8.7.4.5-1: Cell specific test parameters for cell 1 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.7.4.5-2: Cell specific test parameters for cell 2 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		1			
P-CCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	- infinity	8	- infinity	8
I_{oc}	dBm/1.28 MHz	-79.4			
P-CCPCH RSCP [Note3]	dBm	- infinity	-76.17	n.a.	n.a.
P-CCPCH_Ec/Io [Note3]	dB	- infinity	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	- infinity	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ enhanced\_UTRA\_TDD}$

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_TDD}$ = 80 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1122 ms in this test case (note: this gives a total of 1120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.5 E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

8.7.5.1 Test purpose

To verify the UE's ability to make a correct reporting of an event B1. This test will partly verify the E-UTRA TDD-UTRA TDD inter-RAT cell search requirements for increased carrier monitoring UTRA with reduced performance group configured, non DRX given in TS 36.133 [4] in clause 8.1.2.4.1.

8.7.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that support increased carrier monitoring UTRA. Applicability requires support for FGI bits 15 and 22.

8.7.5.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \quad \text{(normal performance),}$$

and

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \quad \text{(reduced performance)}$$

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \quad \text{(normal performance)}$$

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \quad \text{(reduced performance)}$$

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_TDD.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. When the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration, the delay uncertainty is twice the subframe or slot or subslot of the uplink DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in Clause 8.1.2.4.3.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_TDD}$ defined in Clause 8.1.2.4.3.1.1a for the enhanced requirements. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\ UTRA\_TDD}$ defined in clause 8.1.2.4.3.1.1 for the minimum requirements and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement\_UTRA\_TDD}$ defined in clause 8.1.2.4.3.1.2 provided the timing to that cell has not changed more than ± 10 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.7.5.

8.7.5.4 Test description

8.7.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure 54 for UE with 2Rx RF band and Annex A, Figure 99 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.5.4.3.

5. There is one E-UTRA TDD serving cell and seven UTRA TDD frequencies defined and total four cells specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, 3, 4 (UTRA TDD cells) are chosen randomly from given 7 defined UTRA frequencies such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table 8.7.5.4-1: General test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1	Serving cell
UE is configured UTRA RF channel numbers		2, 3, 4, 5, 6, 7, 8	7 UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6, 7,and 8 are indicated to have reduced performance
Test equipment configuration		Cell 1 uses E-UTRA RF cannel number 1 Cell 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7, 8	
Active cell		Cell 1	E-UTRA TDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
CP length of cell 1		normal	
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
B1 Threshold	dBm	-75	UTRA TDD PCCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Ofn	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Scaling factor configurations		8	
T1	s	5	
T2	s	205	

8.7.5.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.7.5.5-1 and 8.7.5.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.5.5-1 and 8.7.5.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1 for cells 2, 3 and 4. If the overall delay measured from the beginning of time period T2 is less than 21.95s (cell 2) and 204.8s (cell 3 and 4) then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cells 2, 3 and 4 primary scrambling code = ((current primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

   - randomly re-assign the frequencies for cells 2, 3 and 4 among the seven UTRA TDD carrier frequencies, according to Table 8.5.8.4-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.5.4.3-1: Message contents

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7.5.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	40	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.5.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId		Set according to specific test	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.5.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd		Set according to specific test	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.5.5 Test requirement

Tables 8.7.5.4.1-1 and 8.7.5.5-1 and 8.7.5.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX.

Table 8.7.5.5-1: Cell specific test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$		5MHz: N_{RB} = 25 10MHz: N_{RB} = 50	
Uplink-downlink configuration of cell 1 as specified in table 4.2.2 in TS 36.211		1	
Special subframe configuration of cell 1 as specified in table 4.2.1 in TS 36.211		6	
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.3.1.1.2		5MHz: R.4 TDD 10MHz: R.0 TDD	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel as specified in clause A.3.1.2.2		5MHz: R.11 TDD 10MHz:R.6 TDD	
OCNG Pattern defined in A.3.2.2.1 and A.3.2.2.9		5MHz: OP.9 TDD 10MHz:OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP Note 3	dBm/15 kHz	-94	-94
Io Note 3	dBm/Ch BW	-64.70 +10log ($N_{RB,c}$ /50)	-64.70 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.7.5.5-2: Cell specific test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #2, cell #3 and cell #4)

Parameter	Unit	Cell 2				Cell 3				Cell 4			
		T1		T2		T1		T2		T1		T2	
Timeslot Number		0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel Number (NOTE1)		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group				Randomly selected from 5,6,7,8 such that cell 3 is in the reduced performance group				Randomly selected from 5,6,7,8 such that cell 4 is in the reduced performance group. Cell 4 RF channel is different from Cell 3 RF channel.			
PCCPCH_Ec/Ior	dB	-Infinity		-3		-Infinity		-3		-Infinity		-3	
DwPCH_Ec/Ior	dB	-Infinity			0	-Infinity			0	-Infinity			0
OCNS_Ec/Ior		-Infinity		-3		-Infinity		-3		-Infinity		-3	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9		-Infinity		9		-Infinity		9	
I_{oc}	dBm/1.28 MHz	-70				-70				-70			
PCCPCH_RSCP Note 3	dB	-Infinity		-64		-Infinity		-64		-Infinity		-64	
Io Note 3	dBm/1.28 MHz	-70.00		-60.49		-70.00		-60.49		-70.00		-60.49	
Propagation Condition		Case 3 (NOTE2)				Case 3 (NOTE2)				Case 3 (NOTE2)			

NOTE1: The DPCH of the cell is located in a timeslot other than 0.
NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B
NOTE3: PCCPCH_RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 21.95s (cell 2) and 204.8s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.7A E-UTRA FDD – UTRA TDD Measurement

8.7A.1 E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

8.7A.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event B1. This test will partly verify the E-UTRA FDD-UTRA TDD inter-RAT cell search requirements for increased carrier monitoring UTRA with reduced performance group configured, non DRX in clause 8.1.2.4.1.

8.7A.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that support increased carrier monitoring UTRA. Applicability requires support for FGI bits 15 and 22.

8.7A.1.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \text{ (normal performance),}$$

and

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \text{ (reduced performance)}$$

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_n \cdot N_{freq,n}\right\} ms \text{ (normal performance)}$$

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot K_r \cdot N_{freq,r}\right\} ms \text{ (reduced performance)}$$

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_TDD.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. When the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration, the delay uncertainty is twice the subframe or slot or subslot of the uplink DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in Clause 8.1.2.4.3.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_TDD}$ defined in Clause 8.1.2.4.3.1.1a for the enhanced requirements. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\ UTRA\_TDD}$ defined in clause 8.1.2.4.3.1.1 for the minimum requirements and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement\_UTRA\_TDD}$ defined in clause 8.1.2.4.3.1.2 provided the timing to that cell has not changed more than ± 10 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or

transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.7.5.

8.7A.1.4 Test description

8.7A.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS for UE with 2Rx RF band and Annex A, Figure FFS for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.7A.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7A.1.4.3.

5. There is one E-UTRA FDD serving cell and seven UTRA TDD frequencies defined and four cells specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7A.1.4-1: General test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1	Serving cell
UE is configured UTRA RF channel numbers		2, 3, 4, 5, 6, 7, 8	7 UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6, 7,and 8 are indicated to have reduced performance
Test equipment configuration		Cell 1 uses E-UTRA RF cannel number 1 Cell 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7, 8	
Active cell		Cell 1	E-UTRA FDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
CP length of cell 1		normal	
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
B1 Threshold	dBm	-75	UTRA TDD PCCPCH RSCP threshold for event B1
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Scaling factor configurations		8	
T1	s	5	
T2	s	205	

8.7A.1.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 7 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.7A.1.5-1 and 8.7A.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7A.1.5-1 and 8.7A.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1 for cells 2, 3 and 4. If the overall delay measured from the beginning of time period T2 is less than 21.95s (cell 2) and 204.8s (cell 3 and 4) then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. The SS shall set Cells 2, 3 and 4 primary scrambling code = ((current primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the seven UTRA TDD carrier frequencies, according to Table 8.5.8.4-1.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7A.1.4.3-1: Common Exception messages for E-UTRAN FDD- UTRAN TDD inter-rat event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7A.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	40	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7A.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId		Set according to specific test	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7A.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd		Set according to specific test	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.A7.1.5 Test requirement

Tables 8.7A.1.4.1-1 and 8.7A.1.5-1 and 8.7A.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD event triggered reporting for increased carrier monitoring UTRA with reduced performance group configured, non DRX.

Table 8.7A.1.5-1: Cell specific test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$		5MHz: N_{RB} = 25 10MHz: N_{RB} = 50	
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.3.1.1.1		5MHz: R.5 FDD 10MHz: R.0 FDD	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel as specified in clause A.3.1.2.1		5MHz: R.11 FDD 10MHz:R.6 FDD	
OCNG Pattern defined in A.3.2.1.1 and A.3.2.1.15		5MHz: OP.15 FDD 10MHz:OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
$\hat{E}_s / I_{ot}$ Note 3	dB	4	4
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP Note 3	dBm/15 kHz	-94	-94
Io Note 3	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-64.76 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.7A.1.5-2: Cell specific test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #2, cell #3 and cell #4)

Parameter	Unit	Cell 2				Cell 3				Cell 4			
		T1		T2		T1		T2		T1		T2	
Timeslot Number		0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel Number (NOTE1)		Randomly selected from 2,3,4 such that cell 2 is in the normal performance group				Randomly selected from 5,6,7,8 such that cell 3 is in the reduced performance group				Randomly selected from 5,6,7,8 such that cell 4 is in the reduced performance group. Cell 4 RF channel is different from Cell 3 RF channel.			
PCCPCH_Ec/Ior	dB	-Infinity		-3		-Infinity		-3		-Infinity		-3	
DwPCH_Ec/Ior	dB	-Infinity			0	-Infinity			0	-Infinity			0
OCNS_Ec/Ior		-Infinity		-3		-Infinity		-3		-Infinity		-3	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9		-Infinity		9		-Infinity		9	
I_{oc}	dBm/1.28 MHz	-70				-70				-70			
PCCPCH_RSCP Note 3	dB	-Infinity		-64		-Infinity		-64		-Infinity		-64	
Io Note 3	dBm/1.28 MHz	-70.00		-60.49		-70.00		-60.49		-70.00		-60.49	
Propagation Condition		Case 3 (NOTE2)				Case 3 (NOTE2)				Case 3 (NOTE2)			

NOTE1: The DPCH of the cell is located in a timeslot other than 0.
NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B
NOTE3: PCCPCH_RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 21.95s (cell 2) and 204.8s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%..

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

8.8 E-UTRAN FDD - GSM measurements

8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN

8.8.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 15 and 23.

8.8.1.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given

in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.

- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.

- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5 and A.8.8.1

8.8.1.4 Test description

8.8.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.8.1.4.3.

5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.1.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.8.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.8.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.1.5-1 and 8.8.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is

increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-10

Table 8.8.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.1.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListGERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

8.8.1.5 Test requirement

Tables 8.8.1.4.1-1, 8.8.1.5-1 and 8.8.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting under AWGN conditions.

Table 8.8.1.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$		4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.8.1.5-2: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE sends one Event B1 triggered measurement report including BSIC of Cell 2.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured shall be less than a total of 3122 ms in this test case. (The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay plus the TTI insertion uncertainty of 2ms).

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM}$ = 2* 480 ms = 960 ms.

Initial BSIC identification delay = 2160 ms.

TTI insertion uncertainty = 2 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.8.2 E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN

8.8.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 5, 15 and 23.

8.8.2.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4]. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in Table 8.1.2.4.5.2.1-1 in TS 36.133 [4]. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.2.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are required with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.1 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every $N_{freq}*30$s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $N_{freq}*60$ s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, GSM BSIC re-confirmation requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.2 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, at least every $N_{freq}*30$ seconds, the UE shall attempt to decode the BSIC of each identified GSM cell. If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $N_{freq}*60$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.2.2.1 in TS 36.133 [4]. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1 of TS 36.133 [4]. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A.8.8.2.

8.8.2.4 Test description

8.8.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.8.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.8.2.4.3.

5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.2.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.1.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.8.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.8.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.8.2.5-1, 8.8.2.5-2, 8.8.2.5-3 and 8.8.2.5-4. propagation conditions are set according to Annex B clause B.1.1.T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.2.5-1 and 8.8.1.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 3162 ms for Test 1 or less than 44082 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.8.2.4.1-1 as appropriate.

8.8.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.2.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-10 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.8.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.2.4.3-3: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.8.2.4.3-4: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.8.2.4.3-6: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.8.2.4.3-7: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.8.2.4.3-8: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.8.2.5 Test requirement

Tables 8.8.2.4.1-1, 8.8.2.5-1 and 8.8.2.5-4 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting when DRX is used under AWGN conditions.

Table 8.8.2.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s / N_{oc}$	dB	4	4
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.8.2.5-2: DRX-Configuration to be used in E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.8.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.8.2.5-4: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = $2*T_{Measurement\ Period,\ GSM} + T_{identify,\ GSM}$ + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

$T_{identify,\ GSM}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = $2*T_{Measurement\ Period,\ GSM} + N_{freq} * 30s$ + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS 36.133 clause 8.1.2.1.1)

$N_{freq} * 30$ s = 30000 ms (as specified in TS 36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.9 E-UTRAN FDD - UTRAN TDD measurements

8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

8.9.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA TDD cell search requirements.

8.9.1.2 Test applicability

This test applies to all types of release 8 E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of release 9 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of release 9 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.9.1.3 Minimum requirement

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

where

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Section 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in section 8.1.2.1.1

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD.}$ Where $X_{basic\ measurementUTRA\_TDD}$= 6.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.9.

8.9.1.4 Test description

8.9.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.9.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.9.1.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.9.1.4.1-1: General test parameters for Event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	E-UTRA FDD Cell 1
Neighbour cell		Cell 2	UTRA TDD Cell 2 is to be identified.
Gap Pattern Id		1	As specified in TS 36.133 section8.1.2.1. Measurement Gap Repetition Period = 80ms
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
Threshold other system	dBm	-75	UTRA TDD PCCPCH RSCP threshold for event B1.
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
T1	s	5	
T2	s	15	

8.9.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.9.1.5-1 and 8.9.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.9.1.5-1 and 8.9.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 12880 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 4) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.9.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.9.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.9.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	40	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	
}			
}			
}			
}			
hysteresis	0		
}			
}			
}			

Table 8.9.1.4.3-3: *MeasuredResults*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.9.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellIdphysicallCellIdentity CHOICE {			
tdd	UTRA-TDD-CellIdentity		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test		
}			
}			

Table 8.9.1.4.3-5: CellGlobalId-UTRA: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CellGlobalIdUTRA ::= SEQUENCE {			
plmn-Identity	PLMN-Identity		
cellIdentity		BIT STRING (SIZE (28))	
}			

8.9.1.5 Test requirement

Tables 8.9.1.4.1-1, 8.9.1.5-1 and 8.9.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.9.1.5-1: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

N_{oc}	dBm/15KHz	-98	
RSRP	dBm	-94	-94
$\hat{E}_s / I_{ot}$	dB	4	4
P-SCH_RP	dBm	-94	
S-SCH_RP	dBm	-94	
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.9.1.5-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell2)

Parameter	Unit	Cell 2			
		T1		T2	
Timeslot Number		0	DwPTS	0	DwPTS
UTRA RF Channel Number (NOTE1)		Channel1			
PCCPCH_Ec/Ior	dB	-Infinity		-3	
DwPCH_Ec/Ior	dB	-Infinity			0
OCNS_Ec/Ior		-Infinity		-3	
$\hat{I}_{or} / I_{oc}$	dB	-Infinity		9	
I_{oc}	dBm/1.28 MHz	-70			
PCCPCH_RSCP	dB	-Infinity		-64	
PropagationCondition		Case 3 (NOTE2)			
NOTE 1: The DPCH of the cell is located in a timeslot other than 0. NOTE 2: Case 3 propagation conditions are specified in TS 25.102 Annex B.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms \backslash$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

8.9.2.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in TS 36.133 [4] section 8.1.2.4.4 under AWGN propagation conditions.

8.9.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 15 and 39.

8.9.2.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length $\leq$ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\ enhanced\_UTRA\_TDD}$:

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 500 ms.

A cell shall be considered detectable when:

- P-CCPCH_Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB

When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.4 and A.8.9.2.

8.9.2.4 Test description

8.9.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 8.9.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.9.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.9.2.4.1-1: General test parameters for E-UTRAN FDD- UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
Time offset between cells	ms	3	
T1	s	5	
T2	s	2	

8.9.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.9.2.5-1 and 8.9.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with Event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.9.2.5-1 and 8.9.2.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 1122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.9.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.9.2.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.9.2.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	32	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.9.2.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.9.2.4.3-4: *MeasResultListUTRA*: E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.9.2.5 Test requirement

Tables 8.9.2.4.1-1, 8.9.2.5-1 and 8.9.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions test.

Table 8.9.2.5-1: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.9.2.5-2: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		1			
P-CCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	- infinity	8	- infinity	8
I_{oc}	dBm/1.28 MHz	-79.4			
P-CCPCH RSCP [Note3]	dBm	- infinity	-76.17	n.a.	n.a.
P-CCPCH_Ec/Io [Note3]	dB	- infinity	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	- infinity	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ enhanced\_UTRA\_TDD}$

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_TDD}$ = 80 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1122 ms in this test case (note: this gives a total of 1120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10 E-UTRAN TDD - GSM measurements

8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN

8.10.1.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements. This test will partly verify the E-UTRAN TDD - GSM cell search requirements in TS 36.133 [4] section 8.1.2.4.6.

8.10.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 15 and 23.

8.10.1.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133 [4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133 [4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq}*480 ms. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in TS 36.133 [4] section 8.1.2.4.5.1.2.1.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in TS 36.133 [4] section 8.1.2.4.5.1.2.2.

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133 [4] section 8.1.2.4.5.1 when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.10.1.3-1.

Table 8.10.1.3-1: The gap length and maximum time difference for BSIC verification

Gap length [ms]	Maximum time difference [µs]
6	± 2350 µs

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in TS 36.133 [4] section 8.1.2.4.5.1.2

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.10.1.3-2. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.10.1.3-2

Number of carriers other than GSM	$T_{identify,gsm}$(ms)		$T_{reconfirm,gsm}$(ms)	
	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)
0	2160	5280	1920	5040
1	5280	21760	5040	17280
2	5280	31680	5040	29280
3	19440	No requirement	13320	No requirement
4	31680	No requirement	29280	No requirement
5	31680	No requirement	29280	No requirement

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement gap used for GSM BSIC reconfirmation as described in TS 36.133 [4] section 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.10.1.3 - 2. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm,GSM}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133 [4] section 8.1.2.4.5.1.2.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133 [4] section 8.1.2.4.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133 [4] section 8.1.2.4.5.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.5.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.1 and A8.10.1

8.10.1.4 Test description

8.10.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.10.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.1.4.3.

5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.1.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.10.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.10.1.5-1 and 8.10.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.1.5-1 and 8.10.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.10.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.1.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-10

Table 8.10.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.1.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN TDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
b1-ThresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB INTEGER(0..30)	
timeToTrigger	ms0		
}			
}			

Table 8.10.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.1.4.3-5: *MeasResultListGERAN*: Additional E-UTRAN TDD - GSM event triggered in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.1.4.3-6: *CarrierFreqGERAN*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.1.5 Test requirement

The test parameters are given in Tables 8.10.1.4.1-1, 8.10.1.5-1 and 8.10.1.5-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table 8.10.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.10.1.5-2: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall send one Event B1 triggered measurement report including the valid BSIC of cell # 2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM}$ = 2* 480ms =960ms.

Initial BSIC identification delay = 2160 ms.

The overall delays measured shall be less than a total of 3122 ms in this test case (note: this gives 960 ms for measurement reporting delay plus 2160 for BSIC identification and plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

8.10.2.1 Test purpose

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD-GSM cell search requirements when DRX is used in TS 36.133 [4] section 8.1.2.4.6.

8.10.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 5, 15 and 23.

8.10.2.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133 [4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133 [4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in table 8.10.2.3-1. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

Table 8.10.2.3-1: GSM measurement period for large DRX

DRX cycle length (s)	$T_{measure,GSM}$ (s) (DRX cycles)
≤0.04	Non DRX Requirements are applicable
0.04<DRX-cycle≤ 0.08	Note ($6*N_{freq}$)
0.08<DRX-cycle≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133 [4] section 8.1.2.4.5.2.1 when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 30 seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are requested with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section TS 36.133 [4] 8.1.2.4.5.1.2.1 shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every N_{freq}*30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within N_{freq}*60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, the GSM BSIC re-conformation requirements corresponding to the non DRX requirements as specified in TS 36.133 [4] section 8.1.2.4.5.1.2.2 shall apply.

For DRX cycle length > 40 ms, at least every N_{freq}*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within N_{freq}*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133 [4] section 8.1.2.4.5.2.2.1. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133 [4] section 8.1.2.4.5.2.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than 2*$T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133 [4] section 8.1.2.4.5.2.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.5.2.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A8.10.2

8.10.2.4 Test description

8.10.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.10.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.2.4.3.

5. In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.2.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.10.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.10.2.4.2 Test procedure

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.10.2.5-1 and 8.10.2.5-4. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.2.5-1 and 8.10.2.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3162 ms for Test1 or less than 44082 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.10.2.4.1-1 as appropriate.

8.10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.2.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-10 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.10.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.2.4.3-3: *PRACH-ConfigSIB-DEFAULT*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7a PRACH-ConfigSIB-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigSIB-DEFAULT ::= SEQUENCE {			
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		TDD
}			
}			

Table 8.10.2.4.3-4: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.10.2.4.3-5: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
b1-ThresholdGERAN	30	GERAN-Thres is actual value in dBm	
}			
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER(0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.10.2.4.3-6: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.10.2.4.3-7: *MeasResults*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.2.4.3-8: *MeasResultListGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.2.4.3-9: *CarrierFreqGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.2.5 Test requirement

Cell specific test parameters are given in Table 8.10.2.5-1 for E-UTRAN and in Table A.8.10.2.5-4 for GSM. DRX configuration for Test1 and Test2 are given in Table 8.10.2.5-2 and time alignment timer and scheduling request related parameters in Table 8.10.2.5-3.

Table 8.10.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.10.2.5-2: drx-Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331.			

Table 8.10.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

Table 8.10.2.5-4: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH. In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = $2*T_{Measurement\ Period,\ GSM} + T_{identify,\ GSM}$ + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

$T_{identify,\ GSM}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = $2*T_{Measurement\ Period,\ GSM} + N_{freq} * 30s$ + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS 36.133 clause 8.1.2.1.1)

N_{freq} * 30 s = 30000 ms (as specified in TS 36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.11 Monitoring of Multiple Layers

8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions

8.11.1.1 Test purpose

To verify that the UE makes correct reporting of multiple events under fading propagation conditions within the E-UTRA FDD inter-frequency cell search requirements.

8.11.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.11.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by Table 8.11.1.3-1.

Table 8.11.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.1.

8.11.1.4 Test description

8.11.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.19 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell1) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.1.4.3.

5. In this test, there are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.1.4.1-1: General test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2, 3	Three FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2 and cell 3	Cell 2 is on RF channel number 2 and cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	10	

8.11.1.4.2 Test procedure

This test scenario comprised of 3 E-UTRA FDD cells operating on different frequencies. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 or cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.1.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.1.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 for cell 2 and cell 3, respectively.

6a. If the measurement reporting delay for cell 2 from the beginning of the time period T2 is less than 7682 ms the number of “cell 2 successes” is increased by one.

6b. If the measurement reporting delay for cell 3 from the beginning of time period T2 is less than 7682 ms the number of “cell 3 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-8 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.1.4.3-2: *MeasConfig-DEFAULT*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A3		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		

}			

Table 8.11.1.4.3-3: *ReportConfigEUTRA-A3*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.1.4.3-4: *MeasResults*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.1.4.3-5: *MeasResults*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.1.4.3-6: *MeasResultListEUTRA*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.11.1.5 Test requirement

Table 8.11.1.4.1-1 and 8.11.1.5-1 define the primary level settings including test tolerances for three E-UTRAN FDD cells.

Table 8.11.1.5-1: Cell specific test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading conditions

Parameter	**Unit**	**Cell 1**		**Cell 2**		**Cell 3**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD		OP.2 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98.00	-98.00	-Infinity	-94.40	-Infinity	-94.40
$\hat{E}_s / I_{ot}$	dB	0	0	-Infinity	3.60	-Infinity	3.60
SCH_RP Note 4	dBm/15 kHz	-98.00	-98.00	-Infinity	-94.40	-Infinity	-94.40
$\hat{E}_s / N_{oc}$	dB	0	0	-Infinity	3.60	-Infinity	3.60
Propagation Condition		AWGN		ETU70		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report for cell 2 with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for cell 3 with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for cell 2 and cell 3.

Decide the test pass, if events for cell 2 **and** cell 3 are passed, otherwise fail the UE.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = Measurement reporting delay + TTI insertion uncertainty

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

8.11.2.1 Test purpose

To verify that the UE makes correct reporting of two event when doing inter frequency measurements.

8.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.11.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|$_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP|dBm and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.11.2.3-1.

Table 8.11.2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.11.2.

8.11.2.4 Test description

8.11.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.19 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell1) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.2.4.3.

5. There are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.2.4.1-1: General test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 μs	Synchronous cells 3μs or 92*Ts
T1	s	5	
T2	s	10	

8.11.2.4.2 Test procedure

This test scenario comprised of 3 E-UTRA TDD cells operating on different frequency. The test consists of two successive time periods, with time duration T1 and T2. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.2.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.2.5-1.

6. UE shall transmit two MeasurementReport message triggered by two events A3 for cell 2 and cell 3, respectively.

6a. If the overall delay measured from the beginning of the time period T2 is less than 7682 ms for event A3 for cell 2 report then the number of “cell 2 successes” is increased by one.

6b. If the overall delay measured from the beginning of time period T2 is less than 7682ms for event A3 for cell 3 report then the number of “cell 3 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A3		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		

}			

Table 8.11.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.2.4.3-4: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.11.2.5 Test requirement

Tables 8.11.2.4.1-1 and 8.11.2.5-1 define the primary level settings including test tolerances for three E-UTRAN TDD cells.

Table 8.11.2.5-1: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98.00	-98.00	-infinity	-94.40	-infinity	-94.40
$\hat{E}_s / I_{ot}$	dB	0	0	-infinity	3.60	-infinity	3.60
SCH_RP Note 4	dBm/15 kHz	-98.00	-98.00	-infinity	-94.40	-infinity	-94.40
$\hat{E}_s / N_{oc}$	dB	0	0	-infinity	3.60	-infinity	3.60
Propagation Condition		AWGN		ETU70		ETU70	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for cell 2 and cell 3.

Decide the test pass, if the events for cell 2 and cell 3 are passed, otherwise fail the UE.

8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

8.11.3.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency and UTRAN FDD measurements under fading propagation conditions.

8.11.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 22, and 25.

8.11.3.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.3 with measurement period given by Table 8.11.3.3-1.

Table 8.11.3.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.3.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.3.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable FDD UTRA cell belonging to the monitored set within.

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] section 9.2 with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

$X_{basic\ measurement\ UTRA\_FDD} = 6$

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period $T_{measurement\_UTRA\_FDD}$ for UTRA FDD CPICH measurements.

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] section 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_FDD}$ defined in TS 36.133 [4]section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\ UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.2 provided the timing to that cell has not changed more than ± 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.1.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.11.3.

8.11.3.4 Test description

8.11.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.24 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell1) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.3.4.3.

5. In this test, there are two cells on different carrier frequencies and one cell on UTRAN carrier frequency. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.3.4.1-1: General test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
E-UTRAN FDD measurement quantity		RSRP	
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/N0	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dB	-86	RSRP threshold for event B2.
b2-Threshold-UTRA	dB	-18	CPICH Ec/N0 threshold for event B2.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	8	

8.11.3.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.3.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.3.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 and B2.

6a. If the measurement reporting delay for event A3 from the beginning of the time period T2 is less than 7682 ms the number of “A3 successes” is increased by one.

6b. If the measurement reporting delay for event B2 from the beginning of time period T2 is less than 4802 ms the number of “B2 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 primary scrambling code = ((current cell 3 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-8 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(UTRA cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
eportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		

}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.3.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	55(-86dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA- EcN0	13 (-18dBm)	UTRA-Thres is actual CPICH Ec/N0 value in dBm	UTRA-FDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.3.4.3-5 *MeasResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.11.3.4.3-7: *MeasuredResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[2]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.3.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra- EcN0		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.3.5 Test requirement

Table 8.11.3.5-1 and 8.11.3.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one UTRAN FDD cell.

Table 8.11.3.5-1: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
$\hat{E}_s/I_{ot}$	dB	2.95	2.95	-Infinity	7.0
SCH_RP Note 4	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
$\hat{E}_s/N_{oc}$	dB	2.95	2.95	-Infinity	7.0
Propagation Condition		AWGN		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.11.3.5-2: Cell specific test parameters for UTRAN FDD (cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 3	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 and B2 are passed, otherwise fail the UE.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event A3 triggered measurement report measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event B2 triggered measurement report measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search

8.11.4.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency measurements and UTRA TDD measurements.

8.11.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 that support UTRA TDD. Applicability requires support for FGI bits 22, and 25.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 22, and 25.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 39, and 25.

8.11.4.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.11.4.3-1.

Table 8.11.4.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: [2] x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has

not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD.}$

$X_{basic\ measurementUTRA\_TDD}$ = 6

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify, UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.

8.11.4.4 Test description

8.11.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.24 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell1) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.4.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.4.4.3.

5. There are two E-UTRA TDD cells operating on different frequency and one UTRA TDD cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.4.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell is on RF channel number 1
Neighbour cell		Cell 2	E-UTRA TDD cell is on RF channel number 2
		Cell 3	1.28Mcps TDD cell
CP length of cell1 and cell2		Normal	
Uplink-downlink configuration of cell1 and cell2		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
UTRAN TDD measurement quantity		RSCP	
DRX		OFF	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hys	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	Parameter for A3 event
Thresh1	dBm	-86	Absolute E-UTRAN RSRP threshold for event B2
Thresh2	dBm	-84	Absolute UTRAN RSCP threshold for event B2
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
Time offset between E-UTRAN TDD cells	µs	3	Synchronous cells
T1	s	>5	During T1, cell 2 and cell 3 shall be powered off. During the off time the physical layer cell identity of cell 2 shall be changed, and the scrambling code of cell 3 shall be changed.
T2	s	15	

8.11.4.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 UTRA TDD cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.4.5-1and Table 8.11.4.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.4.5-1and Table 8.11.4.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7760 ms for event A3 report then the number of "A3 successes" is increased by one.

6b. If the overall delay measured from the beginning of time period T2 is less than 12.88s for event B2 report then the number of "B2 successes" is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 cell parameter id = (current Cell 3 cell parameter id+4) mod 16 for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.4.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.4.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(UTRA cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		

}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.4.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.4.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-8			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	54(-86dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA-RSCP	31(UTRA-Thres + 115)	UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.4.4.3-5: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.4.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.4.4.3-7: *MeasuredResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.4.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSRP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.4.5 Test requirement

Tables 8.11.4.5-1 and 8.11.4.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one UTRAN TDD cell.

Table 8.11.4.5-1: Cell specific test parameters for combined E-UTRAN TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
BWchannel	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
$\hat{E}_s / I_{ot}$	dB	2.95	2.95	-Infinity	7.0
$\hat{E}_s / N_{oc}$	dB	2.95	2.95	-Infinity	7.0
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
SCH_RP	dBm/15 kHz	-95.05	-95.05	-infinity	-91.0
Propagation Condition		AWGN		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.11.4.5-2: Cell specific test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cell search under fading propagation conditions (cell3)

Parameter	Unit	Cell 3 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number*		Channel 3			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	9.0	-Infinity	9.0
I_{oc}	dBm/1.28 MHz	-80.4			
PCCPCH RSCP	dBm	-Infinity	-74.4	n.a.	
Propagation Condition		Case 3			
Note1: The DPCH of all cells are located in a timeslot other than 0. Note2: In the case of multi-frequency network, the UTRA RF Channel Number can be set for the primary frequency in this test. Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 1202m8s from the beginning of time period T2 (note: this gives a total of 12.8 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

8.11.5.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 23, and 25.

8.11.5.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by table 8.11.5.3-1.

Table 8.11.5.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.5.3-1.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS 36.133 [4] section 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] section 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 [4] section 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 of TS 36.133 [4] as:

$$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.

- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.

- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1, 8.1.2.4.5 and A.8.11.5

8.11.5.4 Test description

8.11.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.25 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell3) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.5.4.3.

5. There are two E-UTRA FDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.5.4.1-1: General test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA Pcell RSRP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.5.4.2 Test procedure

This test scenario comprised of 2 E-UTRA FDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.5.5-1and Table 8.11.5.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.5.5-1and Table 8.11.5.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of “A3 successes” is increased by one.

6b. If the overall delays measured from the beginning of time period T2 is less than 7202 ms for event B2 report then the number of “B2 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.5.4.3-1: Common Exception messages for Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.5.4.3-2: *MeasConfig-DEFAULT*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	8 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f3)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f4)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f5)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-	inter frequency	

	GENERIC(f6)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f7)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8	f8 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f8)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-GERAN		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.5.4.3-3: *ReportConfigEUTRA-A3*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.5.4.3-4: *ReportConfigInterRAT-B2-GERAN*: Additional Combined E-UTRAN FDD – E-UTRA FDD Inter-frequency and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7E			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-GERAN(EUTRA-Thres, GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	57(-83dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in TS 36.133 [4]	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-GERAN	30 (-80dBm)		
}			
}			
}			
hysteresis	0 (0 dB)	INTEGER(0..30), 0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.11.5.4.3-5 *MeasResults*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.5.4.3-6: *MeasResultListEUTRA*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.5.4.3-7: *MeasuredResults*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.11.5.4.3-8: *MeasResultListGERAN*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
measResult SEQUENCE {			
rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

8.11.5.5 Test requirement

Tables 8.11.5.5-1 and 8.11.5.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one GSM cell.

Table 8.11.5.5-1: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
RSRP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s / I_{ot}$	dB	3.80	3.80	-Infinity	7.50
SCH_RP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s / N_{oc}$	dB	3.80	3.80	-Infinity	7.50
Propagation Condition		ETU70		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.11.5.5-2: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2* N_{freq}*480ms = 1920ms$.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7202ms from the beginning of time period T2 (note: this gives a total of 7200ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

8.11.6.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 23, and 25.

8.11.6.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by table 8.11.6.3-1.

Table 8.11.6.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional Note 2: T_s is defined in 3GPP TS 36.211 [9]						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\ Inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 of TS 36.133 [4] as:

$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1 of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.1.2.3.2, 8.1.2.4.6 and A.8.11.6.

8.11.6.4 Test description

8.11.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.25 for UE with 2Rx RF band and Annex A, Figure A.89 (without using the faders on cell3) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.11.6.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.6.4.3.

5. There are two E-UTRA TDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.6.4.1-1: General test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration of cell1 and cell2		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
E-UTRAN TDD measurement quantity		RSRP	
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN TDD cells	μs	3	Synchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA Pcell RSRP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.6.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.11.6.5-1and Table 8.11.6.5-2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.6.5-1and Table 8.11.6.5-2.
6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of "A3 successes" is increased by one.

6b. If the overall delays measured from the beginning of time period T2 is less than 7202 ms for event B2 report then the number of "B2 successes" is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.6.4.3-1: Common Exception messages for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.6.4.3-2: *MeasConfig-DEFAULT*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	8 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f3)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f4)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f5)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-	inter frequency	

	GENERIC(f6)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f7)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8	f8 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f8)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-GERAN		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.6.4.3-3: *ReportConfigEUTRA-A3*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.6.4.3-4: *ReportConfigInterRAT-B2-GERAN*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7E			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-GERAN(EUTRA-Thres, GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	57(-83dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in TS 36.133 [4]	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-GERAN	30 (-80dBm)		
}			
}			
}			
hysteresis	0 (0 dB)	INTEGER(0..30), 0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.11.6.4.3-5 *MeasResults*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.6.4.3-6: *MeasResultListEUTRA*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.6.4.3-7: *MeasuredResults*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.11.6.4.3-8: *MeasResultListGERAN*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
measResult SEQUENCE {			
rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

8.11.6.5 Test requirement

Tables 8.11.6.5-1 and 8.11.6.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one GSM cell.

Table 8.11.6.5-1: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
RSRP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s / I_{ot}$	dB	3.80	3.80	-Infinity	7.50
SCH_RP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s / N_{oc}$	dB	3.80	3.80	-Infinity	7.50
Propagation Condition		ETU70		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.11.6.5-2: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7682 ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM}$ = $2*\ N_{freq}*480ms$ = 1920ms.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7202 ms from the beginning of time period T2 (note: this gives a total of 7200 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.12 Void

8.13 Void

8.14 E-UTRAN TDD - FDD Inter-frequency Measurements

8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.14.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA TDD-FDD inter-frequency cell search requirements. This test will partly verify the TDD-FDD inter-frequency cell search requirements in section 8.1.2.3.3.

8.14.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bit 25.

8.14.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period given by table 8.14.1.3-1.

Table 8.14.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.14.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.14.1.

8.14.1.4 Test description

8.14.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.14.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.1.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.1.4.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell1 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell1 Uplink-downlink configuration		1	As specified in TS 36.211 section 4.2 Table 4.2-2.
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 1 E-UTRA TDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA FDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133[4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.14.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0 is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.14.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.14.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.1.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.14.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.14.1.5 Test requirement

Tables 8.14.1.4.1-1 and 8.14.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous TDD-FDD inter frequency cells test.

Table 8.14.1.5-1: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.14.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA TDD-FDD inter-frequency cell search requirements.

8.14.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5 and 25.

8.14.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.14.2.3-1:

Table 8.14.2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.14.2.3-2.

Table 8.14.2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.3.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.3.2 and A.8.14.2.

8.14.2.4 Test description

8.14.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.14.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.2.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.2.4.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
Cell1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
Cell1PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Cell2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1. Note that UE may only be allocated at *On Duration*
Cell2PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1		one TDD carrier frequencies is used.
E-UTRA RF Channel Number		2		one FDD carrier frequencies is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133[4] section 8.1.2.1.
Cell1 Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Cell1 Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.14.2.5-2
Time offset between cells		3 ms		Asynchronous cells
T1	s	5		
T2	s	5	30	

8.14.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.14.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.14.2.4.1-1 as appropriate.

8.14.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.2.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.14.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.14.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.14.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.14.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.14.2.5 Test requirement

Tables 8.14.2.4.1-1, 8.14.2.5-1, 8.14.2.5-2 and 8.14.2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.14.2.5-1: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.14.2.5-2: DRX-Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.14.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.14.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.14.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.14.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 25.

8.14.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,inter} = T_{basic\_identify\_CGI,\,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,\,inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.4 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to TS 36.331[5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in TS 36.133 [4] Table 8.1.2.3.2.1-1 is used, the UE shall have more than 30 ACK/NACK transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.6 and A.8.14.3.

8.14.3.4 Test description

8.14.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.14.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.3.4.3.

5. There is one E-UTRA TDD carrier and one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.3.4.1-1: General test parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell1 E-UTRA RF channel number		1	One TDD carrier is used
Cell2 E-UTRA RF channel number		2	One FDD carrier is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell1 special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9].
Cell1 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9].
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1 [5].
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331[5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.14.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time

duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.14.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.3.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.14.3.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. The SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to the UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message.
12. The UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.
13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.14.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.3.4.3-1: Common Exception messages for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.14.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.3.4.3-3: *MeasResults*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.14.3.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.14.3.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.14.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity of cell 2		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.14.3.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.14.3.4.3-9: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.14.3.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.14.3.4.3-11: *MeasResults*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.14.3.5 Test requirement

Tables 8.14.3.4.1-1 and 8.14.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.14.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\ inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\ inter} = T_{basic\_identify\_CGI,\ inter} \quad ms$$

$T_{basic\_identify\_CGI,\ intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.3.7.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.15 E-UTRAN FDD - TDD Inter-frequency Measurements

8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.15.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD - TDD inter-frequency cell search requirements. This test will verify the FDD-TDD inter-frequency cell search requirements in section 8.1.2.3.4.

8.15.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bit 25.

8.15.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.15.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	

0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.4 and A.8.15.1.

8.15.1.4 Test description

8.15.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.1.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.1.4.1-1: General test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in TS 36.133 section 8.1.2.1.
Cell2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to Cell 2.
Cell2 Uplink-downlink configuration		1	As specified in TS 36.211 section 4.2 Table 4.2-2. Applicable to Cell 2.
CP length		Normal	
Cell 1 E-UTRA FDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA TDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	10	

8.15.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #1is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.15.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.1.4.3-1: Common Exception messages for Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.15.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.15.1.5 Test requirement

Tables 8.15.1.4.1-1 and 8.15.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous FDD-TDD inter frequency cells test.

Table 8.15.1.5-1: Cell specific test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD) and in D.2.2 (OP.2 TDD)		OP.1 FDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 7680 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.15.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-TDD inter-frequency cell search requirements.

8.15.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5 and 25.

8.15.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.15.2.3-1.

Table 8.15.2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.15.2.3-2.

Table 8.15.2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes

a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.4.2 and A.8.15.2.

8.15.2.4 Test description

8.15.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 for UE with 2Rx RF band and Annex A, Figure A.78 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.15.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.2.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.2.4.1-1: General test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2 Note that UE may only be allocated at *On Duration*
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2
Cell 1 E-UTRA FDD RF Channel Number		1		One FDD carrier frequency is used.
Cell 2 E-UTRA TDD RF Channel Number		2		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
Cell 2 Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211
Cell 2 Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211
E-UTRA TDD PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
E-UTRA TDD Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.15.2.5-2
Time offset between cells	ms	3		Asynchronous cells
T1	s	5		
T2	s	5	30	

8.15.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.15.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.2.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.15.2.4.1-1 as appropriate.

8.15.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.2.4.3-1: Common Exception messages for Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.15.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.15.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.15.2.4.3-5: *MeasResults:* Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.15.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.15.2.5 Test requirement

Tables 8.15.2.5-1, 8.15.2.5-2 and 8.15.2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.15.2.5-1: Cell specific test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD) and in D.2.2 (OP.2 TDD)		OP.1 FDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.15.2.5-2: DRX-Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.15.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213 [8].

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.15.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.15.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.15.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition in TDD for HO. Applicability requires support for FGI bit 25.

8.15.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133[4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.4 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to TS 36.331[5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.8 and A.8.15.3.

8.15.3.4 Test description

8.15.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.15.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.3.4.3.

5. There is one E-UTRA FDD carrier and one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.3.4.1-1: General test parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1 PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
Cell1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	One FDD and one TDD carrier frequency are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell 2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9].
Cell 2 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9].
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331[5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.15.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.15.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.3.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.15.3.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. The SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to the UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message.

12. The UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receives the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.15.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.3.4.3-1: Common Exception messages for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.15.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.3.4.3-3: *MeasResults*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.15.3.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.15.3.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
Release	NULL		
}			

Table 8.15.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.15.3.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.15.3.4.3-9: *SystemInformationBlockType2*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.15.3.4.3-10: *SystemInformationBlockType5*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
}			

Table 8.15.3.4.3-11: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.15.3.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.15.3.4.3-13: *MeasResults*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.3.4.3-14: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
}			

8.15.3.5 Test requirement

Tables 8.15.3.4.1-1 and 8.15.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.15.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.2.2 (OP.2 TDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 1]	dB						
OCNG_RB[Note 1]	dB						

$\hat{E}_s / I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.							
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI,inter}$ + reporting delay

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 60 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133[4] Section 8.1.2.3.5.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.16 E-UTRAN Carrier Aggregation Measurements

8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX

8.16.1.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.1.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.1.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,

- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated SCell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.1.

8.16.1.4 Test description

8.16.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders, and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.1.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.1.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×measCycleSCell)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.1.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the

transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.1.4.3.

4. Set the parameters according to T1 in Table 8.16.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.1.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.1.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.1.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.1.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.1.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.16.1.4.3-4: *MeasConfig:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.1.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.1.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.1.4.3-7: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.16.1.4.3-8: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.1.5 Test requirement

Table 8.16.1.4-1 and Table 8.16.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.1.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	μs	-			0			3		
OCNG Patterns defined inD.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
$OCNG\_RA$ Note 1	dB									
$OCNG\_RB$ Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.96	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
Propagation Condition		ETU70								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc}$

$T_{identify\_scc} = 20$ *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX

8.16.2.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.2.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.2.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8

identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.2.

8.16.2.4 Test description

8.16.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders, and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.2.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.2.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.2.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.2.4.3.

4. Set the parameters according to T1 in Table 8.16.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.2.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.2.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2” is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.2.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.2.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.2.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.16.2.4.3-4: *MeasConfig:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.2.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.2.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.2.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.16.2.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.2.5 Test requirement

Table 8.16.2.4-1 and Table 8.16.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.2.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
$OCNG\_RA$ Note 1	dB									
$OCNG\_RB$ Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.96	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
Propagation Condition		ETU70								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc}$

$T_{identify\_scc} = 20$ *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

8.16.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA FDD-FDD measurements of the secondary component carrier cell search requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.3.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.3.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.3.

8.16.3.4 Test description

8.16.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.3.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.3.4.1-1: General test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	1280	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.3.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.3.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.3.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

Table 8.16.3.4.3-2: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.3.4.3-3: *SystemInformationBlockType2*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.3.4.3-4: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.3.5 Test requirement

Table 8.16.3.4.1-1 and Table 8.16.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.3.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	10		10		10	
OCNG Pattern defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD		OP.2 FDD		OP.2 FDD	
Timing offset to Cell1	μs	-		0		3	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Propagation Condition		AWGN					

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

8.16.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA TDD-TDD measurements of the secondary component carrier cell search requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.4.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.4.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.4.

8.16.4.4 Test description

8.16.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.4.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.4.4.1-1: General test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211 [8] The same configuration applies to all cells
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	1280	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.4.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.4.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.4.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receive the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.4.4.3-1: Common Exception messages for E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

8.16.4.5 Test requirement

Table 8.16.4.4.1-1 and Table 8.16.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.4.5-1: Cell specific test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	10		10		10	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
Timing offset to Cell1	µs	-		0		3	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Propagation Condition		AWGN					

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

8.16.5.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.5.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.5.

8.16.5.4 Test description

8.16.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders, and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.5.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.5.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.4 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.10 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)		MHz	20	Channel bandwidth for cells on primary and secondary component carriers
A2	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
Note 1: See Table 8.16.1.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.5.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.5.4.3.

4. Set the parameters according to T1 in Table 8.16.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.5.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.5.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A2" is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.5.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.5.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.5.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2	n100	
}			
}			

Table 8.16.5.4.3-4: *MeasConfig:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.5.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.5.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.5.4.3-7: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.16.5.4.3-8: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.5.5 Test requirement

Table 8.16.5.4-1 and Table 8.16.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20 MHz channel BW.

Table 8.16.5.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20			20		
OCNG Patterns defined in A.3.2.1.11 (OP.11 FDD) and in A.3.2.1.12 (OP.12 FDD)		OP.11 FDD			OP.12 FDD			OP.12 FDD		
N_{oc} Note 2	dBm/15 kHz	-104			-104.1					
RSRP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/I_{ot}$	dB	19.2	19.2	-3	19.3	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/N_{oc}$	dB	19.2	19.2	-3	19.3	19.3	-3.1	-infinity	19	-3
Note: See Table 8.16.1.5.1-1 for other cell-specific test parameters.										

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc.}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay $= T_{identify\_scc.}$

$T_{identify\_scc} = 20$ *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay $= T_{measure\_scc}$

where $T_{measure\_scc} = 5$ *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

8.16.6.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.6.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.6.

8.16.6.4 Test description

8.16.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders, and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.6.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.6.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)		MHz	20	Channel bandwidth for cells on primary and secondary component carriers
A2	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
Note 1: See Table 8.16.2.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.6.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.6.4.3.

4. Set the parameters according to T1 in Table 8.16.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.6.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.6.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2” is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.6.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.6.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.6.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2	n100	
}			
}			

Table 8.16.6.4.3-4: *MeasConfig:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.6.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.6.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.6.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.16.6.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.6.5 Test requirement

Table 8.16.6.4-1 and Table 8.16.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-e vent triggered reporting on configured but deactivated SCell in non-DRX test under fading propagation conditions for 20 MHz channel BW.

Table 8.16.6.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20			20		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD			OP.8 TDD			OP.8 TDD		
N_{oc} Note 2	dBm/15 kHz	-104			-104.1					
RSRP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/I_{ot}$	dB	19.2	19.2	-3	19.3	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/N_{oc}$	dB	19.2	19.2	-3	19.3	19.3	-3.1	-infinity	19	-3
Note: See Table 8.16.2.5-1 for other cell-specific test parameters.										

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

$T_{identify\_scc}$ = 20 *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

8.16.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA FDD measurements of the secondary component carrier cell search requirements in TS 36.133[4] section 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

8.16.7.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.7.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,

- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell. This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.7.

8.16.7.4 Test description

8.16.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.7.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.7.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	20	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.7.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.7.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.7.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.7.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

Table 8.16.7.4.3-2: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.7.4.3-3: *SystemInformationBlockType2*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.7.4.3-4: *SystemInformationBlockType3*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.7.5 Test requirement

Table 8.16.7.4.1-1 and Table 8.16.7.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test for 20 MHz channel bandwidth.

Table 8.16.7.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	20		20		20	
OCNG Patterns defined in D.1.17 (OP.17 FDD) and in D.1.12 (OP.12 FDD)		OP.17 FDD		OP.12 FDD		OP.12 FDD	
N_{oc} Note 3	dBm/15 kHz	-101		-101			
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty

- Measurement reporting delay = 25.6s

  - TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.8 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

8.16.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA TDD measurements of the secondary component carrier cell search requirements in TS 36.133[4] section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.8.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.8.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell. This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.8.

8.16.8.4 Test description

8.16.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.8.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.8.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	20	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.8.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2

respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.8.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.8.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.8.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

T

8.16.8.5 Test requirement

Table 8.16.8.4.1-1 and Table 8.16.8.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test for 20 MHz channel bandwidth.

Table 8.16.8.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	20		20		20	
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD		OP.8 TDD		OP.8 TDD	
N_{oc} Note 3	dBm/15 kHz	-101		-101			
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

8.16.9.1 Test purpose

Same test purpose as in clause 8.16.1.1.

8.16.9.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.1.3.

8.16.9.4 Test description

8.16.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for cells on the PCC and 5 MHz for cells on the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.9.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.9.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carriers ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary carriers
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary carriers
Note 1: See Table 8.16.1.4.1-1 for the other general parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.9.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.1.4.3 → use Table 8.16.9.4.3.

- Instead of Table 8.16.1.5-1 → use Table 8.16.9.5-1.

8.16.9.4.3 Message contents

Same message contents as in clause 8.16.1.4.3.

8.16.9.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.9.4.1-1.
- Instead of Table 8.16.1.5-1 → use Table 8.16.9.5-1.

Table 8.16.9.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			5			5		
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD			N/A			N/A		
PDSCH allocation	n_{PRB}	13—36			N/A			N/A		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.6 FDD			R.11 FDD			R.11 FDD		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.16 (OP.16 FDD)		OP.1 FDD			OP.16 FDD			OP.16 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

8.16.10.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.10.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.10.4 Test description

8.16.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.10.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.10.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.10.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carriers ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary carriers
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary carriers
Note 1: See Table 8.16.2.4.1-1 for the other general parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.10.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.10.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.10.5-1.

8.16.10.4.3 Message contents

Same message contents as in clause 8.16.2.4.3.

8.16.10.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.10.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.10.5-1.

Table 8.16.10.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			5			5		
PDSCH Reference measurement channel defined in A.1.2		R.0 TDD			N/A			N/A		
PDSCH allocation	n_{PRB}	13—36			N/A			N/A		
PCFICH/PDCCH/PHICH parameters defined in A.2.2		R.6 TDD			R.12 TDD			R.12 TDD		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	μs	-			0			3		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.10 (OP.10 TDD)		OP.1 TDD			OP.10 TDD			OP.10 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 kHz	-101.00			-101.00					
RSRP[Note 3]	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP[Note 3]	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

8.16.11.1 Test purpose

Same test purpose as in clause 8.16.3.1.

8.16.11.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.3.3.

8.16.11.4 Test description

8.16.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.11.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.11.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.11.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.11.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of Table 8.16.3.4.3 → use Table 8.16.11.4.3.
- Instead of Table 8.16.3.5-1 → use Table 8.16.11.5-1.

8.16.11.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.11.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.11.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.11.5-1.

Table 8.16.11.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	10		5		5	
OCNG Patterns defined in D.1.10 (OP.10 FDD) and D.1.16 (OP.16 FDD)		OP.10 FDD		OP.16 FDD		OP.16 FDD	
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

8.16.12.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.12.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.12.4 Test description

8.16.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.12.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.12.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.12.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.12.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.12.4.3.

- Instead of Table 8.16.4.5-1 → use Table 8.16.12.5-1.

8.16.12.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.12.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.12.4.1-1.

- Instead of Table 8.16.4.5-1 → use Table 8.16.12.5-1.

Table 8.16.12.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	10		5		5	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.10 (OP.10 TDD)		OP.1 TDD		OP.10 TDD		OP.10 TDD	
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz

8.16.13.1 Test purpose

Same test purpose as in clause 8.16.1.1.

8.16.13.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.13.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.1.3.

8.16.13.4 Test description

8.16.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders, and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.13.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.13.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.13.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary component carrier
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
Note 1: See Table 8.16.1.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.13.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.1.4.3 → use Table 8.16.13.4.3.
- Instead of Table 8.16.1.5-1 → use Table 8.16.13.5-1.

8.16.13.4.3 Message contents

Same message contents as in clause 8.16.1.4.3.

8.16.13.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.13.4.1-1.
- Instead of Table 8.16.1.5-1 → use Table 8.16.13.5-1.

Table 8.16.13.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2			2	
$BW_{channel}$	MHz	10			10			10	
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low	
Timing offset to Cell 1	µs	-			0			3	
OCNG Patterns defined inD.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD			OP.16 FDD			OP.16 FDD	
PBCH_RA	dB	0			0			0	
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00				
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz bandwidth

8.16.14.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.14.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.14.4 Test description

8.16.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.14.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.14.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.14.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4.TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary component carrier
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
Note 1: See Table 8.16.2.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.14.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.14.4.3.

- Instead of Table 8.16.2.5-1 → use Table 8.16.14.5-1.

8.16.14.4.3 Message contents

Same message contents as in clause 8.16.2.4.3.

8.16.14.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.14.4.1-1.

- Instead of Table 8.16.2.5-1 → use Table 8.16.14.5-1.

Table 8.16.14.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and in D.2.10 (OP.10 TDD)		OP.9 TDD			OP.10 TDD			OP.10 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

8.16.15.1 Test purpose

Same test purpose as in clause 8.16.3.1.

8.16.15.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.15.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.3.3.

8.16.15.4 Test description

8.16.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.15.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.15.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.15.4.1-1: General test parameters for E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.15.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of Table 8.16.3.4.3 → use Table 8.16.15.4.3.

- Instead of Table 8.16.3.5-1 → use Table 8.16.15.5-1.

8.16.15.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.15.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.15.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.15.5-1.

Table 8.16.15.5-1: Cell specific test parameters for E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	5		5		5	
OCNG Patterns defined in D.1.20 (OP.20 FDD) and in D.1.16 (OP.16 FDD)		OP.20 FDD		OP.16 FDD		OP.16 FDD	
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

8.16.16.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.16.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.16.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.16.4 Test description

8.16.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:
   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.
2. The general test parameter settings are set up according to Table 8.16.16.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.16.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.16.4.1-1: General test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C3.3.1.			

8.16.16.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.16.4.3.

- Instead of Table 8.16.4.5-1 → use Table 8.16.16.5-1.

8.16.16.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.16.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.16.4.1-1.

- Instead of Table 8.16.4.5-1 → use Table 8.16.16.5-1.

Table 8.16.16.5-1: Cell specific test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	5		5		5	
OCNG Patterns defined in D.2.9 (OP.9 TDD) and in D.2.10 (OP.10 TDD)		OP.9 TDD		OP.10 TDD		OP.10 TDD	
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX

8.16.17.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.16.17.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.17.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+24 provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
    - the UE has sent a valid measurement report for the SCell being activated and
    - the SCell being activated remains detectable according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2,
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section TS 36.133 [4] 8.3.3.2.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+34 provided the SCell can be successfully detected on the first attempt.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe *n*+24 or *n*+34 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [8] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [8] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [26] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+9* when PCell belongs to E-UTRA FDD.

Starting from the subframe specified in TS 36.213 [8] section 4.3 and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for the SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n*+9 when PCell belongs to E-UTRA FDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.17.

8.16.17.4 Test description

8.16.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - or UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.17.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.17.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.17.4.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD (Cell 1)	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	µs	0	
Time alignment error between cell2 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	7	During this time the PCell shall be known and the SCell configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.17.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.17.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.17.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   6a. For intra-band CA UE,

   - If the first CSI report for SCell is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and DTX is not observed by the SS outside the subframes (m+5) to (m+13) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

   6b. For inter-band CA UE,

   - If the first CSI report is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and ≤ 2 non-consecutive DTX subframes are observed by the SS during the subframes (m+5) to (m+13) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

   8a. For intra-band CA UE,

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8)
   - and DTX is not observed by the SS outside the subframes time span (n+5) to (n+13) up to the end of T3,ms from the beginning of time period T3 by the SS
   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

   8b. For inter-band CA UE,

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
   - and ≤ 2 non-consecutive DTX subframes are observed by the SS during the subframes (n+5) to (n+13) up to the end of T3,
   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.17.4.3-1: Common Exception messages for E-UTRAN FDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.17.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.17.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.17.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.17.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.17.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.17.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.17.5 Test requirement

Table 8.16.17.4.1-1 and Table 8.16.17.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known SCell in non-DRX test.

Table 8.16.17.5-1: Cell specific test parameters for E-UTRAN FDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/N_{oc}$	dB	17			17		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+24).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

Figures 8.16.17.5-1 and 8.16.17.5-2 show the deriviation of the Test procedure requreiment for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

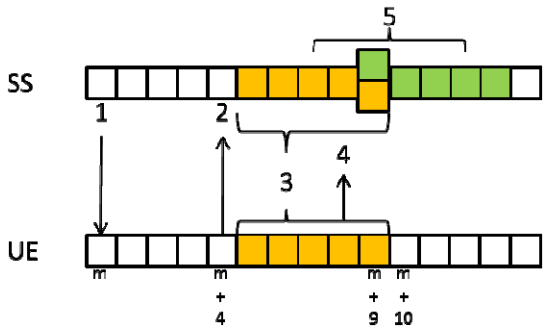

Figure 8.16.17.5-1: Procedure derivation for Activation (Intra-band case)

1) Activation command for SCell
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Possible DTX reception period on SS due to interruption by SCell1 activation

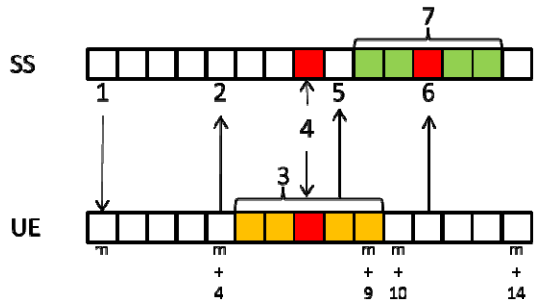

Figure 8.16.17.5-2: Procedure derivation for Activation (Inter-band case)

1) Activation command for SCell
2) ACK for MAC-CE for SCell activation
3) Possible interruption period by SCell activation
4) Allowed interruption timing(1 subframe in m+5~m+9) on UE by SCell activation,

   that is, possible DTX timing on SS
5) First CSI report timing(could be invalid CQI) at m+8 (might be m+10 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell activation
7) Possible DTX reception period on SS due to interruption by SCell1 activation

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+ 9).

The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.17AE-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The test procedure and requirement for interruption of PCell needs further investigation

8.16.17A.1 Test purpose

Same test purpose as defined in clause 8.16.17.1.

8.16.17A.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.17A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 8.16.17.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.17A.

8.16.17A.4 Test description

8.16.17A.4.1 Initial conditions

Same initial conditions as in clause 8.16.17.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- The listed parameter values in Table 8.16.17A.4.1-1 will replace the values of corresponding parameters in Table 8.16.17.4.1-1 other parameters keep the same.

Table 8.16.17A.4.1-1: General test parameters for known SCell activation case for 20MHz +20MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD	As specified in section A.2

8.16.17A.4.2 Test procedure

Same test procedure as in clause 8.16.17.4.2.

8.16.17A.4.3 Message contents

Same as Message contents as in clause 8.16.17.4.3.

8.16.17A.5 Test requirement

Table 8.16.17A.4.1-1 and Table 8.16.17A.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known SCell in non-DRX test. The listed parameter values in Table 8.16.17A.5-1 will replace the values of corresponding parameters in Table 8.16.17.5-1 other parameters keep the same.

Table 8.16.17A.5-1: Cell specific test parameters for E-UTRAN FDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20		
OCNG Patterns defined in D.1.17 (OP.17 FDD) and in D.1.12 (OP.12 FDD)		OP.17 FDD			OP.12 FDD		

The UE shall send the first CSI report for SCell at latest 9ms into T2.

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 9ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 9ms into T3.

The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX

8.16.18.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.16.18.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.18.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+24 provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:

  - the UE has sent a valid measurement report for the SCell being activated and

  - the SCell being activated remains detectable according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2,

- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+34 provided the SCell can be successfully detected on the first attempt.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe *n*+24 or *n*+34 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [8] with the exception of CQI index = 0 (out of range) provided:

- the conditions in TS 36.133 [4] section 7.7 are met over the entire SCell activation delay and

- the conditions for CQI reporting defined in Section 7.2.3 of [8] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [26] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

Starting from subframe n+11 when PCell belongs to E-UTRA TDD and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI in SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.18.

8.16.18.4 Test description

8.16.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.18.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.18.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.18.4.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	µs	0	
Time alignment error between cell2 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1	µs	3	Synchronous cells
T1	s	7	During this time the PCell shall be known and the SCell configured, detected and reported.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.18.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see 3GPP TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.18.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.18.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8). T2 starts.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

6a. For intra-band CA UE:

- If the first CSI report for SCell is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption
  - or (m+13) if the subframe (m+8) and subframe (m+9) were subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24) ,
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
- and DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

6b. For inter-band CA UE

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
- and DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+5), (m+9) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+6), (m+13) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+7), (m+13) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframe (m+8) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframe (m+9) up to the end of T2,
  - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+10), (m+14) up to the end of T2,

- or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+11), (m+18) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation. If the last CSI report is received less than or equal to 8ms from the beginning of time period T3 by the SS

   8a. For intra-band CA UE

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) up to the end of T3,

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

   8b. For inter-band CA UE

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+5), (n+9) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+6), (n+13) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+7), (n+13) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+8) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+9) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+10), (n+14) up to the end of T3,

     - or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+11), (n+18) up to the end of T3,

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.18.4.3-1: Common Exception messages for E-UTRAN TDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.18.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.18.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.18.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.18.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.18.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	FALSE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.18.4.3-7: *MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.18.5 Test requirement

Table 8.16.18.4.1-1 and Table 8.16.18.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known SCell in non-DRX test.

Table 8.16.18.5-1: Cell specific test parameters for E-UTRAN TDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/N_{oc}$	dB	17			17		
Propagation Condition		AWGN			AWGN		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

The UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 11ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 11ms into T3.

[The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.]

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.18AE-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth

8.16.18A.1 Test purpose

Same test purpose as defined in clause 8.16.18.1.

8.16.18A.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.18A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 8.16.18.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.18A.

8.16.18A.4 Test description

8.16.18A.4.1 Initial conditions

Same initial conditions as in clause 8.16.18.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- The listed parameter values in Table 8.16.18A.4.1-1 will replace the values of corresponding parameters in Table 8.16.18.4.1-1 other parameters keep the same.

Table 8.16.18A.4.1-1: General test parameters for known SCell activation case for 20MHz +20MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2

8.16.18A.4.2 Test procedure

Same test procedure as in clause 8.16.18.4.2.

8.16.18A.4.3 Message contents

Same message contents as in clause 8.16.18.4.3.

8.16.18A.5 Test requirement

Table 8.16.18A.4.1-1 and Table 8.16.18A.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known SCell in non-DRX test. The listed parameter values in Table 8.16.18A.5-1 will replace the values of corresponding parameters in Table 8.16.18.5-1 other parameters keep the same.

Table 8.16.18A.5-1: Cell specific test parameters for E-UTRAN TDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD			OP.8.TDD		

The UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 11ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 11ms into T3.

[The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.]

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.19

8.16.20

8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth

8.16.21.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.21.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.21.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.21.4 Test description

8.16.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 8.16.21.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.21.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.21.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.21.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbor cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.				

8.16.21.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.21.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.21.5-1.

8.16.21.4.3 Message contents

Same message contents as in clause 8.16.2.4.3 with the following exceptions:

Table 8.16.21.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.21.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.21.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.21.5-1.

Table 8.16.21.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Parameter	Unit	Combination	Cell 1			Cell 2			Cell 3		
			T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		All	1			2			2		
$BW_{channel}$		20MHz+10MHz	20MHz: $N_{RB,c}$ = 100			10MHz: $N_{RB,c}$ = 50			10MHz: $N_{RB,c}$ = 50		
		10MHz+20MHz	10MHz: $N_{RB,c}$ = 50			20MHz: $N_{RB,c}$ = 100			20MHz: $N_{RB,c}$ = 100		
Correlation Matrix and Antenna Configuration		All	1x2 Low			1x2 Low			1x2 Low		
PDSCH Reference measurement channel defined in A.1.2 (TDD)		20MHz+10MHz	R.3 TDD			N/A			N/A		
		10MHz+20MHz	R.0 TDD			N/A			N/A		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 (TDD)		20MHz+10MHz	R.10 TDD			R.6 TDD			R.6 TDD		
		10MHz+20MHz	R.6 TDD			R.10 TDD			R.10 TDD		
OCNG Patterns defined in D.2 (TDD)		20MHz+10MHz	OP.7 TDD			OP.2 TDD			OP.2 TDD		
		10MHz+20MHz	OP.1 TDD			OP.8 TDD			OP.8 TDD		
PBCH_RA	dB	All	0			0			0		
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 1]	dB										
OCNG_RB[Note 1]	dB										
N_{oc}[Note 2]	dBm/15 kHz	All	-104			-104.10					
RSRP [Note 3]	dBm/15 kHz	All	-84.80	-84.80	-107	-84.80	-84.80	-107.20	-infinity	-85.10	-107.10
$\hat{E}_s/I_{ot}$	dB	All	19.20	19.20	-3	19.30	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP [Note 3]	dBm/15 kHz	All	-84.80	-84.80	-107	-84.80	-84.80	-107.20	-infinity	-85.10	-107.10
$\hat{E}_s/N_{oc}$	dB	All	19.20	19.20	-3	19.30	19.30	-3.10	-infinity	19	-3
Propagation Condition		All	ETU70								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

8.16.22.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.22.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.22.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.22.4 Test description

8.16.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 8.16.22.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.22.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.22.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.22.4.1-1: General test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211 [8] The same configuration applies to all cells
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	1280	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.22.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.22.4.3.
- Instead of Table 8.16.4.5-1 → use Table 8.16.22.5-1.

8.16.22.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.22.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.22.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.22.5-1.

Table 8.16.22.5-1: Cell specific test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

Parameter	Unit	Combination	Cell 1		Cell 2		Cell 3	
			T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		All	1		2		2	
$BW_{channel}$		20MHz+10MHz	20MHz: $N_{RB,c}$ = 100		10MHz: $N_{RB,c}$ = 50		10MHz: $N_{RB,c}$ = 50	
		10MHz+20MHz	10MHz: $N_{RB,c}$ = 50		20MHz: $N_{RB,c}$ = 100		20MHz: $N_{RB,c}$ = 100	
PDSCH Reference measurement channel defined in A.1.2 (TDD)		20MHz+10MHz	R.3 TDD		N/A		N/A	
		10MHz+20MHz	R.0 TDD		N/A		N/A	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 (TDD)		20MHz+10MHz	R.10 TDD		R.6 TDD		R.6 TDD	
		10MHz+20MHz	R.6 TDD		R.10 TDD		R.10 TDD	
OCNG Pattern defined in D.2 (TDD)		20MHz+10MHz	OP.7 TDD		OP.2 TDD		OP.2 TDD	
		10MHz+20MHz	OP.1 TDD		OP.8 TDD		OP.8 TDD	
PBCH_RA	dB	All	0		0		0	
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB							
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA Note 1	dB							
OCNG_RB Note 1	dB							
N_{oc} Note 3	dBm/15 kHz	All	-101					
RSRP Note 4	dBm/15 kHz	All	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s / I_{ot}$	dB	All	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	All	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s / N_{oc}$	dB	All	16	16	16	16	-Infinity	16
Propagation Condition		All	AWGN					

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD

8.16.23.1 Test purpose

To verify that in TDD-FDD CA with PCell in FDD the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

8.16.23.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell. Applicability requires support for FGI bit 111.

8.16.23.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

Measurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.1.2.2 (E-UTRAN intra frequency measurements and E-UTRAN intra frequency measurements with autonomous gaps).

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1, 8.3.2 and A.8.16.23.

8.16.23.4 Test description

8.16.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.23.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.23.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.23.4.3.

5. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbour cell on the TDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.23.4.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbor cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.

8.16.23.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of clause 8.16.1.4.3 → use clause 8.16.23.4.3.
- Instead of Table 8.16.1.5-1 → use Table 8.16.23.5-1.

8.16.23.4.3 Message contents

Same message contents as in clause 8.16.1.4.3 with the following exceptions:

Table 8.16.23.4.3-1: *ReportConfig-A2-H*: Additional E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.23.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.23.4.1-1.
- Instead of Table 8.16.1.5-1 → use Table 8.16.23.5-1.

Table 8.16.23.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-		
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104.5					
$\hat{E}_s/N_{oc}$	dB	17.20	17.20	-3	17.70	17.70	-3.70	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$	dB	17.20	17.20	-3	17.70	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2		
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD

8.16.24.1 Test purpose

To verify that in TDD-FDD CA with PCell in TDD the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

8.16.24.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell. Applicability requires support for FGI bit 111.

8.16.24.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.24.4 Test description

8.16.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.24.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.89. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.24.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.24.4.3.

5. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbour cell on the FDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.24.4.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9].
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9].
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.

8.16.24.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of clause 8.16.2.4.3 → use clause 8.16.24.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.24.5-1.

8.16.24.4.3 Message contents

Same message contents as in clause 8.16.2.4.3 with the following exceptions:

Table 8.16.24.4.3-1: *ReportConfig-A2-H*: Additional E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.24.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.24.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.24.5-1.

Table 8.16.24.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns defined		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104.5					
$\hat{E}_s/N_{oc}$	dB	17.20	17.20	-3	17.70	17.70	-3.70	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$	dB	17.20	17.20	-3	17.70	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2		
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD

8.16.25.1 Test purpose

To verify that in TDD-FDD CA with PCell in FDD the UE's ability to make a correct reporting of Event A6 on deactivated SCell with PCell interruption in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in TS 36.133[4] clause 8.3.2 while at the same time fulfilling the requirements on interruption rate.

8.16.25.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell. Applicability requires support for FGI bit 111.

8.16.25.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.25.4 Test description

8.16.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.25.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.25.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.25.4.3.

5. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbour cell on the TDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.25.4.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	1280	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)

8.16.25.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of clause 8.16.3.4.3 → use clause 8.16.25.4.3.
- Instead of Table 8.16.3.5-1 → use Table 8.16.25.5-1.

8.16.25.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.25.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.25.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.25.5-1.

Table 8.16.25.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		-		-	
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns defined		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-101		-101			
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-infinity	16
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-infinity	-0.11
RSRP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
SCH_RP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
Io Note 3	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		0		3	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		N/A	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD

8.16.26.1 Test purpose

To verify that in TDD-FDD CA with PCell in TDD the UE's ability to make a correct reporting of Event A6 on deactivated SCell with PCell interruption in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in TS 36.133[4] clause 8.3.2 while at the same time fulfilling the requirements on interruption rate.

8.16.26.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell. Applicability requires support for FGI bit 111.

8.16.26.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.26.4 Test description

8.16.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.26.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.26.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.26.4.3.

5. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbour cell on the FDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.26.4.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	1280	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)

8.16.26.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of clause 8.16.4.4.3 → use clause 8.16.26.4.3.
- Instead of Table 8.16.4.5-1 → use Table 8.16.26.5-1.

8.16.26.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.26.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.26.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.26.5-1.

Table 8.16.26.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-		-	
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns defined		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-101		-101			
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-infinity	16
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-infinity	-0.11
RSRP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
SCH_RP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
Io Note 3	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		0		3	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		N/A	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.27 to 8.16.42Void

8.16.43 to 8.16.46

8.16.47 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

8.16.47.1 Test purpose

To verify that the PUCCH SCell activation and deactivation times are within the requirements when the PUCCH SCell is known by the UE at the time of activation.

8.16.47.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support PUCCH transmission on SCell in CA. Applicability requires support for FGI bit 25.

8.16.47.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

The requirements in this section shall apply for the UE configured with one downlink SCell and when PUCCH is configured for the SCell being activated.

If the UE has a valid TA for transmitting on an SCell then the UE shall be able to transmit valid CSI report and apply actions related to the SCell activation command as specified in [11] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{activate\_basic}$:

Where:

- A TA is considered to be valid provided that the *TimeAlignmentTimer* [5] associated with the TAG containing the PUCCH SCell is running.

- $T_{activate\_basic}$ is the SCell activation delay as defined in TS 36.133 [4] section 7.7.2.

If the UE does not have a valid TA for transmitting on an SCell then the UE shall be capable to perform downlink actions related to the SCell activation command as specified in [11] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{activate\_basic}$ and shall be capable to perform uplink actions related to the SCell activation command as specified in [11] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{delay\_PUCCH\ SCell}$ and shall transmit valid CSI report for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{delay\_PUCCH\ SCell}$, where:

$$T_{delay\_PUCCH\ SCell} = T_{activate\_basic} + T_1 + T_2 + T_3$$

Where:

- T_1 is the delay uncertainty in acquiring the first available PRACH occasion in the PUCCH SCell. T1 is up to 25 subframes and the actual value of T_1 shall depend upon the PRACH configuration used in the PUCCH SCell.

- T_2 is the delay for obtaining a valid TA command for the sTAG to which the SCell configured with PUCCH belongs. T_2 is up to 13 subframes.

- T_3 is the delay for applying the received TA for uplink transmission. T_3 is 6 subframes.

The above delay requirement ($T_{delay\_PUCCH\ SCell}$) shall apply provided that:

- The UE has received a PDCCH order to initiate RA procedure on the PUCCH SCell within $T_{activate\_basic}$ otherwise additional delay to activate the SCell is expected; and

- The RA on PUCCH SCell is not interrupted by the RA on PCell otherwise additional delay to activate the SCell is expected; and

- No SRS carrier based switching occurs during the SCell activation procedure otherwise the PUCCH SCell activation delay ($T_{delay\_PUCCH\ SCell}$) can be extended.

The interruption on the PCell specified in section TS 36.133 [4] 7.8.2 shall meet all applicable requirements in clause TS 36.133 [4] 7.7.2.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.47.

8.16.47.4 Test description

8.16.47.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.47.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

- or UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.47.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.47.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.47.4.1-1: General test parameters for 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for the test.
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell.
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe.
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
TimeAlignmentTimer	ms	1280	Cell 1 in pTAG.
TimeAlignmentTimerSTAG	ms	1280	Cell 2 in sTAG.
T1	s	7	During this time the PCell shall be known and the SCell shall be configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.

8.16.47.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see 3GPP TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.47.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) with PUCCH configuration on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.47.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   6a. For intra-band CA UE,

   - If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),

- or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)

- and DTX in PCell is not observed by the SS outside the subframes (m+5) to (m+13) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

6b. For inter-band CA UE,

- If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),

  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)

- and ≤ 2 non-consecutive DTX subframes in PCell are observed by the SS during the subframes (m+5) to (m+13) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

   8a. For intra-band CA UE,

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8)

   - and DTX in PCell is not observed by the SS outside the subframes time span (n+5) to (n+13) up to the end of T3

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

   8b. For inter-band CA UE,

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and ≤2 non-consecutive DTX subframes in PCell are observed by the SS during the subframes (n+5) to (n+13) up to the end of T3,

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.47.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.47.4.3-1: Common Exception messages for E-UTRAN FDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.47.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.47.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.47.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3-6A using condition UL CA and PUCCH-SCell			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.47.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10	*CQI-ReportPeriodic-r10-DEFAULT*		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.47.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
}			
ri-ConfigIndex	Not present		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.47.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.47.5 Test requirement

Table 8.16.47.4.1-1 and Table 8.16.47.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known PUCCH SCell in non-DRX test.

Table 8.16.47.5-1: Cell specific test parameters for 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns defined in D.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
Timing offset to Cell 1	µs	-			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE		
PRACH Configuration index Note 6		-			4		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 6: As specified in table 5.7.1-2 in TS 36.211.

During T2 the UE shall start sending CSI report for the SCell with non-zero CQI index on the PUCCH SCell no later than subframe (m+58). During T2 if there are no uplink resources for reporting the valid CSI in the subframe (m+58) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

During T2 interruption of the PCell during the SCell activation shall not occur outside subframe (m+5) to (m+9).

During T3 the UE shall stop sending CSI reports from the PUCCH SCell no later than subframe (n+8).

During T3 interruption of the PCell during the SCell deactivation shall not occur outside subframe (n+5) to (n+9).

The interruption of the PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation and deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.48 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

8.16.48.1 Test purpose

To verify that the PUCCH SCell activation and deactivation times are within the requirements when the PUCCH SCell is known by the UE at the time of activation.

8.16.48.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 13 and forward that support PUCCH transmission on SCell in CA. Applicability requires support for FGI bit 25.

8.16.48.3 Minimum conformance requirements

The same minimum conformance requirements as defined in 8.16.47.3.

8.16.48.4 Test description

8.16.48.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.48.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

- or UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.48.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.48.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.48.4.1-1: General test parameters for 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for the test.
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to all cells
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every second subframe.
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
TimeAlignmentTimer	ms	1280	Cell 1 in pTAG.
TimeAlignmentTimerSTAG	ms	1280	Cell 2 in sTAG.
T1	s	7	During this time the PCell shall be known and the SCell shall be configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.

8.16.48.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see 3GPP TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.48.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) with PUCCH configuration on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.48.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

6a. For intra-band CA UE,

- If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)
- and DTX in PCell is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

6b. For inter-band CA UE,

- If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)
- and DTX in PCell is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

8a. For intra-band CA UE,

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8)
- and DTX in PCell is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) and the subframes (n+20) to (n+24) and (n+28), up to the end of T3,
  - or DTX in PCell is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) and the subframes (n+21) to (n+25) and (n+28) to (n+29), up to the end of T3,

- or DTX in PCell is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) and the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

8b. For inter-band CA UE,

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

- and DTX in PCell is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,

  - or DTX in PCell is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.48.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.48.4.3-1: Common Exception messages for E-UTRAN TDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.48.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.48.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.48.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3-6A using condition UL CA and PUCCH-SCell			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.48.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10	*CQI-ReportPeriodic-r10-DEFAULT*		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.48.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
}			
ri-ConfigIndex	Not present		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.48.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.48.5 Test requirement

Table 8.16.48.4.1-1 and Table 8.16.48.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known PUCCH SCell in non-DRX test.

Table 8.16.48.5-1: Cell specific test parameters for 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in D.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
Timing offset to Cell 1	µs	-			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE		
PRACH Configuration index Note 6		-			4		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 6: As specified in table 5.7.1-2 in TS 36.211.

During T2 the UE shall start sending CSI report for the SCell with non-zero CQI index on the PUCCH SCell no later than subframe (m+58). During T2 if there are no uplink resources for reporting the valid CSI in the subframe (m+58) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

During T2 interruption of the PCell during the SCell activation shall not occur outside subframe (m+5) to (m+11).

During T3 the UE shall stop sending CSI reports from the PUCCH SCell no later than subframe (n+8).

During T3 interruption of the PCell during the SCell deactivation shall not occur outside subframe (n+5) to (n+11).

The interruption of the PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation and deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.49 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

8.16.49.1 Test purpose

To verify that the PUCCH SCell activation and deactivation times are within the requirements when the PUCCH SCell is known by the UE at the time of activation.

8.16.49.2 Test applicability

This test applies to all types of E-UTRA UE release 13 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell and PUCCH transmission on SCell in CA. Applicability requires support for FGI bit 25.

8.16.49.3 Minimum conformance requirements

The same minimum conformance requirements as defined in 8.16.47.3.

8.16.49.4 Test description

8.16.49.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.49.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

- or UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.49.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.49.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.49.4.1-1: General test parameters for 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for the test.
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell.
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe.
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
TimeAlignmentTimer	ms	1280	Cell 1 in pTAG.
TimeAlignmentTimerSTAG	ms	1280	Cell 2 in sTAG.
T1	s	7	During this time the PCell shall be known and the SCell shall be configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.

8.16.49.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.49.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) with PUCCH configuration on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.49.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   - If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),

     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)

   - and ≤ 2 non-consecutive DTX subframes in PCell are observed by the SS during the subframes (m+5) to (m+13) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and ≤2 non-consecutive DTX subframes in PCell are observed by the SS during the subframes (n+5) to (n+13) up to the end of T3,

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.49.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.49.4.3-1: Common Exception messages for E-UTRAN TDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.49.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_Add Mod
}			

Table 8.16.49.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.49.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3-6A using condition UL CA and PUCCH-SCell			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.49.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10	*CQI-ReportPeriodic-r10-DEFAULT*		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.49.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
}			
ri-ConfigIndex	Not present		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.49.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.49.5 Test requirement

Table 8.16.49.4.1-1 and Table 8.16.49.5-1 define the primary level settings including test tolerances for E-UTRAN 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell in non-DRX test.

Table 8.16.49.5-1: Cell specific test parameters for 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
TDD special subframe configuration		-			6		
TDD uplink-downlink configuration		-			1		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in D.1 for FDD and D.2 for TDD		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
Timing offset to Cell 1	µs	-			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE		
PRACH Configuration index Note 6		-			4		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 6: As specified in table 5.7.1-2 in TS 36.211.

During T2 the UE shall start sending CSI report for the SCell with non-zero CQI index on the PUCCH SCell no later than subframe (m+58). During T2 if there are no uplink resources for reporting the valid CSI in the subframe (m+58) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

During T2 interruption of the PCell during the SCell activation shall not occur outside subframe (m+5) to (m+9).

During T3 the UE shall stop sending CSI reports from the PUCCH SCell no later than subframe (n+8).

During T3 interruption of the PCell during the SCell deactivation shall not occur outside subframe (n+5) to (n+9).

The interruption of the PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation and deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.50 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

8.16.50.1 Test purpose

To verify that the PUCCH SCell activation and deactivation times are within the requirements when the PUCCH SCell is known by the UE at the time of activation.

8.16.50.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 13 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell and PUCCH transmission on SCell in CA. Applicability requires support for FGI bit 25.

8.16.50.3 Minimum conformance requirements

The same minimum conformance requirements as defined in 8.16.47.3.

8.16.50.4 Test description

8.16.50.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.50.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

- or UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.16.50.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.50.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.50.4.1-1: General test parameters for 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for the test.
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell.
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every second subframe.
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
TimeAlignmentTimer	ms	1280	Cell 1 in pTAG.
TimeAlignmentTimerSTAG	ms	1280	Cell 2 in sTAG.
T1	s	7	During this time the PCell shall be known and the SCell shall be configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.

8.16.50.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.50.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) with PUCCH configuration on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.50.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   - If CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+58),

- or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+58)

- and DTX in PCell is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
  - or DTX in PCell is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.
   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
   - and DTX in PCell is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,
     - or DTX in PCell is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,
   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the

UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.50.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.50.4.3-1: Common Exception messages for E-UTRAN TDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.50.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.50.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.50.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3-6A using condition UL CA and PUCCH-SCell			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.50.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10	*CQI-ReportPeriodic-r10-DEFAULT*		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.50.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
}			
ri-ConfigIndex	Not present		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.50.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.50.5 Test requirement

Table 8.16.50.4.1-1 and Table 8.16.50.5-1 define the primary level settings including test tolerances for E-UTRAN 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell in non-DRX test.

Table 8.16.50.5-1: Cell specific test parameters for 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
TDD special subframe configuration		6					
TDD uplink-downlink configuration		1					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns defined in D.1 for FDD and D.2 for TDD		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
Timing offset to Cell 1	µs	-			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE		
PRACH Configuration index Note 6		-			4		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [9].

During T2 the UE shall start sending CSI report for the SCell with non-zero CQI index on the PUCCH SCell no later than subframe (m+58). During T2 if there are no uplink resources for reporting the valid CSI in the subframe (m+58) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

During T2 interruption of the PCell during the SCell activation shall not occur outside subframe (m+5) to (m+11).

During T3 the UE shall stop sending CSI reports from the PUCCH SCell no later than subframe (n+8).

During T3 interruption of the PCell during the SCell deactivation shall not occur outside subframe (n+5) to (n+11).

The interruption of the PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation and deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.51 to 8.16.78Void

8.16.79 to 8.16.82

8.16.83 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

8.16.83.1 Test purpose

The purpose of this test is to verify that the UE correctly detects events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [5] within the requirements stated in clause 8.3.3.2.1.

8.16.83.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and E-UTRA TDD and 3DL CA. If the generic duplex-mode test case 8.16.83 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.83 is tested with TDD PCell, it will be only applicable to UEs supporting TDD as PCell.

Applicability requires support for FGI bit 111s

Note on the applicability: If the generic duplex-mode test case 8.16.83 is tested with FDD PCell, the specific duplex-mode test cases 8.16.27 and 8.16.29 do not need to be tested. if the generic duplex-mode test case 8.16.86 is tested with TDD PCell, the specific duplex-mode test cases 8.16.28 and 8.16.30 do not need to be tested.

8.16.83.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within Tidentify_scc, according to the parameter measCycleSCell where Tidentify_scc = 20 measCycleSCell

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] sub-clause 9.1 are fulfilled for a corresponding Band,

- SCH_RP|dBm and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated SCell measurements is Tmeasure_scc according to the parameter measCycleSCell where Tmeasure_scc = 5 measCycleSCell. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of Tmeasure_scc.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than Tidentify_scc defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_scc defined in TS 36.133 [4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than Tmeasure_scc provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and 8.16.83.

8.16.83.4 Test description

8.16.83.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.83.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure TBD for UE supporting 4Rx RF band on any of the CC.

2. The general test parameter settings are set up according to Table 8.16.83.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.83.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is a SCell on RF channel number 2, Cell 3 is a SCell on RF channel number 3, and Cell 4 is a neighbour cell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.83.4.1-1: General test parameters for E-UTRAN generic duplex mode 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to any TDD cells (cell1, cell2, cell3 and cell4 may be configured for FDD or TDD operation).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to any TDD cells (cell1, cell2, cell3 and cell4 may be configured for FDD or TDD operation).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the cell1 and cell3 shall be known to the UE; but cell2 and cell 4 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event A6 for cell4 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms, and 1.6s for cells 1, 2 and 3, respectively.

8.16.83.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. At the beginning of T2 the transmission power of cell 4 is increased to the same level as cell 3, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2 and for Cell 3. Cells 1, 2, 3 and 4 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (cell 2 and cell 3) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.83.4.3.
4. Set the parameters according to T1 in Table 8.16.83.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.83.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.83.5-1.
11. The UE shall transmit MeasurementReport messages triggered by Event A2 for cell 1, cell 2 and cell 3, respectively.
12. If the measurement reporting delay for cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.
13. If the measurement reporting delay for cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.
14. If the measurement reporting delay for cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.
15. After the SS receives the MeasurementReport message in steps 12, 13 and 14 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
16. Set cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

17. Set cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of cell 4 = physical cell identity of cell 3 then skip this physical cell identity value for cell 4.

18. After the RRC connection release, the SS:
    - transmits in cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

19. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2” and “Cell 3 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.83.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.83.4.3-1: Common Exception messages for 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.83.4.3-2: MeasConfig-DEFAULT: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)and neighbouring cell on the SCC (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	5 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		

}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.83.4.3-3: MeasObjectEUTRA-GENERIC: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.83.4.3-4: ReportConfig-A1: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.83.4.3-5: ReportConfig-A2: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.83.4.3-6: MeasurementReport: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.83.4.3-7: MeasurementReport: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.83.4.3-8: MeasurementReport: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.83.4.3-9: MeasurementReport: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	4		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

Table 8.16.83.4.3-10: MeasurementReport: Additional 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with generic duplex modes

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	5		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

8.16.83.5 Test requirement

Table 8.16.83.5-1 defines the primary level settings including test tolerances for E-UTRAN generic duplex modes 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX.

Table 8.16.83.5-1: Cell specific test parameters for E-UTRAN generic duplex modes 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3					
Duplex mode		FDD or TDD			FDD or TDD			FDD or TDD					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD			5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD			5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz FDD: OP.16 FDD 10MHz FDD: OP.2 FDD 20MHz FDD: OP.12 FDD 5MHz TDD: OP.10 TDD 10MHz TDD: OP.2 TDD 20MHz TDD: OP.8 TDD			5MHz FDD: OP.16 FDD 10MHz FDD: OP.2 FDD 20MHz FDD: OP.12 FDD 5MHz TDD: OP.10 TDD 10MHz TDD: OP.2 TDD 20MHz TDD: OP.8 TDD			5MHz FDD: OP.16 FDD 10MHz FDD: OP.2 FDD 20MHz FDD: OP.12 FDD 5MHz TDD: OP.10 TDD 10MHz TDD: OP.2 TDD 20MHz TDD: OP.8 TDD		
PBCH_RA	dB	0			0			0			0		
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB												
PHICH_RB	dB												
PDCCH_RA	dB												
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA[Note 1]	dB												

OCNG_RB Note 1	dB												
Noc Note 2	dBm/15 KHz	-104			-104			-104.5					
Ês/Noc	dB	17	17	-3	-infinity	17.2	-3.2	17.7	17.7	-3.7	-infinity	17	-3.7
Ês/Iot Note 3	dB	17	17	-3	-infinity	17.2	-3.2	17.7	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	--74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 3		
Propagation Condition		AWGN			ETU70			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2			1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	μs	-			0			0			3		
Time alignment error relative to cell 1 Note 5	μs	-			≤ TAE			≤ TAE			N/A		
Time alignment error relative to cell 2 Note 5	μs	-			-			≤ TAE			N/A		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than Tidentify_scc

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = Tidentify_scc
- Tidentify_scc = 20 measCycleSCell
- measCycleSCell = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = Tidentify_scc
- Tidentify_scc = 20 measCycleSCell
- measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is Tmeasure_scc according to the parameter measCycleSCell.

The overall delays measured test requirement for Event A2 for cell 2 and cell 3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = Tmeasure_scc
- where Tmeasure_scc = 5 measCycleSCell.

The UE shall send one Event A2 triggered measurement report for cell 2 and one Event A2 triggered measurement report for cell 3 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, and Cell 3 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.16.84 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

8.16.84.1 Test Purpose

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [5] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

8.16.84.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of UE release 12 and forward supporting E-UTRA FDD and E-UTRA TDD and 3DL CA. If the generic duplex-mode test case 8.16.84 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.84 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell.

Applicability requires support for FGI bit 111

Note on the applicability: If the generic duplex-mode test case 8.16.84 is tested with FDD PCell, the specific duplex-mode test cases 8.16.31 and 8.16.33 do not need to be tested. if the generic duplex-mode test case 8.16.86 is tested with TDD PCell, the specific duplex-mode test cases 8.16.32 and 8.16.34 do not need to be tested..

8.16.84.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within Tidentify_scc, according to the parameter measCycleSCell where Tidentify_scc = 20 measCycleSCell

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP|dBm and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is Tmeasure_scc according to the parameter measCycleSCell where Tmeasure_scc = 5 measCycleSCell. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of Tmeasure_scc.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty

is: 2 x TTIDCCH. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than Tidentify_scc defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_scc defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than Tmeasure_scc provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and 8.16.31.

8.16.84.4 Test description

8.16.84.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.31.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.65 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure TBD for UE supporting 4Rx RF band on any of the CC.

2. The general test parameter settings are set up according to Table 8.16.84.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.84.4.3.

5. There are three E-UTRA carriers and four cells: Cell1, Cell2, Cell3 and Cell4. Cell 1 is PCell on the primary component (RF Channel 1), Cell 2 is the SCell on the Secondary Component (RF Channel 2), and Cell 3 is SCell on the secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the secondary component (RF Channel 3). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.84.4.1-1: General test parameters for E-UTRAN 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to any TDD cells (cell1, cell2, cell3 and cell4 may be configured for FDD or TDD operation).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to any TDD cells (cell1, cell2, cell3 and cell4 may be configured for FDD or TDD operation).
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.84.4.2 Test procedure

The test consists of Cell 1 the PCell on the primary component (RF Channel 1), Cell 2 the SCell on the Secondary Component Carrier (RF Channel 2), and Cell 3 SCell on the secondary component (RF Channel 3) and Cell 4 the neighbour cell on the secondary component (RF Channel 3). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used.

The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

Cells 1, 2, 3 and 4 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell Cell 2 and SCell Cell 3 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.
4. Set the parameters according to T1 in Table 8.16.84.5-1.as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.
6. The UE shall transmit RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.84.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.84.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).
10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.84.5-1.
11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell2, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.
12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.
14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events "T2 A6" and "T4 A6" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.84.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.84.4.3-1: Common Exception messages for 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.84.4.3-2: MeasConfig-DEFAULT: 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with generic duplex modes test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.84.4.3-4: MeasurementReport: 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with generic duplex modestest requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.84.4.3-5: SystemInformationBlockType2: Additional 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with generic duplex modes test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1, Cell2 in FDD
}			

8.16.84.5 Test Requirements

Table 8.16.84.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes.

Table 8.16.84.5-1: Cell specific test parameters for E-UTRAN 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				3			
Duplex mode		FDD or TDD				FDD or TDD				FDD or TDD				FDD or TDD			
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in A.3.2.1 and A.3.2.2		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP. 7 TDD				5MHz: OP.19FDD; 10MHz:OP.6 FDD; 20MHz: OP.14FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.19FDD; 10MHz:OP.6 FDD; 20MHz: OP.14FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.19FDD; 10MHz:OP.6 FDD; 20MHz: OP.14FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.20 FDD; 10MHz:OP.10 FDD; 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.16FDD; 10MHz:OP.2 FDD; 20MHz: OP.12FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.16FDD; 10MHz:OP.2 FDD; 20MHz: OP.12FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
PBCH_RA	dB	0				0				0				0			

PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA Note 1	dB																
OCNG_RB Note 1	dB																
N_{oc} Note 3	dBm/15 kHz	-101				-101				-101							
$\hat{E}_s / N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	- Infinity	16	- Infinity	16
$\hat{E}_s / I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	- Infinity	-0.11	- Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	- Infinity	-85	- Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	- Infinity	-85	- Infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				3			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				N/A			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12.8s (20×scellMeasCycle) from the beginning of time period T2.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3.2s (5×scellMeasCycle) from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the start of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.85 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

8.16.85.1 Test Purpose

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCell is known by the UE at the time of activation.

8.16.85.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and EUTRA TDD and 3DL CA. If the generic duplex-mode test case 8.16.85 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.85 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell.

Applicability requires support for FGI bit 25.

If the generic duplex-mode test case 8.16.85 is tested with FDD PCell, the specific duplex-mode test cases 8.16.35 and 8.16.37 do not need to be tested. if the generic duplex-mode test case 8.16.85 is tested with TDD PCell, the specific duplex-mode test cases 8.16.36 and 8.16.38 do not need to be tested.

8.16.85.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 3$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and 8.8.16.85.

8.16.85.4 Test description

8.16.85.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.85.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:
   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.85.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.85.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.85.4.1-1: General test parameters for 3 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured, detected and reported
T2	s	1	During this time the UE shall activate the SCell1.
T3	s	1	During this time the UE shall deactivate the SCell1.

8.16.85.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

There are three carriers, each with one cell. Cell 1, Cell 2 and Cell 3 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.85.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.85.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.85.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+10).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

   8a. For FDD PCell case:

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2.
   - and:
     - the PCell and SCells are intra-band between each other, or
     - the PCell and SCells are inter-band between each other, and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2, or
     - the PCell and SCell1 are intra-band and SCell2 is inter-band, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For TDD PCell case:

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption
     - or (m+13) if the subframes (m+8) and (m+9) were subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)
   - and:
     - if the PCell and SCells are intra-band between each other and:
       - DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2, or
       - DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2, or
       - DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2
     - else if the PCell and SCells are inter-band between each other and:

- DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2, or
- DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2

- else if the PCell and SCell1 are intra-band and SCell2 is inter-band:
  - and:
    - DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13), or
    - DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14), or
    - DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18)
  - and:
    - DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2, or
    - DTX is not observed by the SS outside the subframe (m+23), up to the end of T2, or
    - DTX is not observed by the SS outside the subframe (m+24), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2

- Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation. If the last CSI report is received by the SS earlier than or equal to subframe (n+8), and, up to the end of T3:

    11a. For FDD PCell case:

- if DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23),
- and:
  - the PCell and SCells are intra-band between each other, or
  - the PCell and SCells are inter-band between each other, and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23), or
  - the PCell and SCell1 are intra-band and SCell2 is inter-band, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23)
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11b. For TDD PCell case:

- if the PCell and SCells are intra-band between each other and:
  - DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) and the subframes (n+20) to (n+24) and (n+28), or
  - DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) and the subframes (n+21) to (n+25) and (n+28) to (n+29), or
  - DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) and the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33)
- else if the PCell and SCells are inter-band between each other and:
  - DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), or
  - DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), or
  - DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), or
  - DTX is not observed by the SS outside the subframes (n+8) and (n+23), or
  - DTX is not observed by the SS outside the subframes (n+9) and (n+24), or
  - DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), or
  - DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33)
- else if the PCell and SCell1 are intra-band and SCell2 is inter-band
  - and:
    - DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13), or
    - DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14), or
    - DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
  - and:
    - DTX is not observed by the SS outside the subframes (n+20) and (n+24), or
    - DTX is not observed by the SS outside the subframes (n+21) and (n+28), or
    - DTX is not observed by the SS outside the subframes (n+22) and (n+28), or
    - DTX is not observed by the SS outside the subframe (n+23), or
    - DTX is not observed by the SS outside the subframe (n+24), or

- DTX is not observed by the SS outside the subframes (n+25) and (n+29), or
- DTX is not observed by the SS outside the subframes (n+26) and (n+33)

- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, or a fail was counted for the event “Deactivation”, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.85.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.85.4.3-1: Common Exception messages for 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.85.4.3-2: *PhysicalConfigDedicated-DEFAULT:* 3 DL FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_Add Mod
}			

Table 8.16.85.4.3-3: *CQI-ReportConfig-DEFAULT:* 3 DL *CA* activation and deactivation of known SCell in non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.85.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.85.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.85.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.85.4.3-7: *MeasObjectEUTRA-GENERIC:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.85.4.3-8: *SystemInformationBlockType2:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 in FDD
}			

Table 8.16.85.4.3-9: *QuantityConfig-DEFAULT:* 3 DL CA Activation and Deactivation of Known SCell in Non-DRX condition requirements with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

8.16.85.5 Test Requirements

Table 8.16.85.5-1 defines the Cell specific test parameters for known SCell1 activation.

Table 8.16.85.5-1: Cell specific test parameters for 3DL CA Activation and Deactivation of known SCell1 in Non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
Duplex mode		FDD or TDD			FDD or TDD			FDD or TDD		
TDD special subframe configuration		6			6			6		
TDD uplink-downlink configuration		1			1			1		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	μs	-			0			0		
Time alignment error relative to cell 1 Note 5	μs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	μs	-			-			≤ TAE		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell1 in subframe (m+8), or in subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+9) and (m+8) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+29).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+11) and (m+15) to (m+19) for FDD PCell, and not happen outside subframes (m+5) to (m+11) and (m+20) to (m+26) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+11) and (n+15) to (n+19) for FDD PCell, and not happen outside subframes (n+5) to (n+11) and (n+20) to (n+26) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+29) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

8.16.86 3 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

8.16.86.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCell is unknown by the UE at the time of activation.

8.16.86.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test also applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and E-UTRA TDD and 3DL CA. If the generic duplex-mode test case 8.16.86 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.86 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell.

Applicability requires support for FGI bit 25.

Note on the applicability: If the generic duplex-mode test case 8.16.86 is tested with FDD PCell, the specific duplex-mode test cases 8.16.39 and 8.16.41 do not need to be testedif the generic duplex-mode test case 8.16.86 is tested with

TDD PCell, the specific duplex-mode test cases 8.16.40 and 8.16.42 do not need to be tested. In addition, the generic duplex-mode test case 8.16.86 shall only be tested once regardless of the PCell duplex mode selected.

8.16.86.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.86.

8.16.86.4 Test description

8.16.86.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.86.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell and Unknown SCell (Cell 2), use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.86.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.86.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the Deconfigured deactivated SCell on RF channel number 2, and Cell 3 is Configured deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.86.4.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2.
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.			

8.16.86.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1, Cell 2 and Cell 3 are either FDD or TDD cells, according to the test configuration. Cell 1 and Cell 3 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.86.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.86.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.86.4.3.
6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.
7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10).
8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

8a. For FDD PCell case:

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+10) if the subframe (m+8) was subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2.
- and:
  - the PCell and SCells are intra-band between each other, or
  - the PCell and SCells are inter-band between each other, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+5) to (m+13) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23), or
  - the PCell and SCell1 are intra-band and SCell2 is inter-band, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23)
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8b. For TDD PCell case:

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

- or (m+9) if the subframe (m+8) was subject to interruption
- or (m+13) if the subframes (m+8) and (m+9) were subject to interruption

- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
- and:
  - if the PCell and SCells are intra-band between each other and:
    - DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2
  - else if the PCell and SCells are inter-band between each other and:
    - DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2, or
    - DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2
  - else if the PCell and SCell1 are intra-band and SCell2 is inter-band:
    - and:
      - DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13), or
      - DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14), or
      - DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18)
    - and:
      - DTX not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2, or
      - DTX not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2, or
      - DTX not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2, or
      - DTX not observed by the SS outside the subframe (m+23), up to the end of T2, or
      - DTX not observed by the SS outside the subframe (m+24), up to the end of T2, or

- DTX not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2, or
- DTX not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2

- Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCC1 and SCC2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation. If the last CSI report is received by the SS earlier than or equal to subframe (n+8), and, up to the end of T3:

    11a. For FDD PCell case:

    - if DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23),
    - and:
        - the PCell and SCells are intra-band between each other, or
        - the PCell and SCells are inter-band between each other, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+5) to (n+13) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23), or
        - the PCell and SCell1 are intra-band and SCell2 is inter-band, and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23)
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For TDD PCell case:

    - if the PCell and SCells are intra-band between each other and:
        - DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) and the subframes (n+20) to (n+24) and (n+28), or
        - DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) and the subframes (n+21) to (n+25) and (n+28) to (n+29), or
        - DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) and the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33)
    - else if the PCell and SCells are inter-band between each other and:
        - DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), or
        - DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), or
        - DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), or
        - DTX is not observed by the SS outside the subframes (n+8) and (n+23), or
        - DTX is not observed by the SS outside the subframes (n+9) and (n+24), or
        - DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), or
        - DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33)

- else if the PCell and SCell1 are intra-band and SCell2 is inter-band
  - and:
    - DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13), or
    - DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14), or
    - DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
  - and:
    - DTX is not observed by the SS outside the subframes (n+20) and (n+24), or
    - DTX is not observed by the SS outside the subframes (n+21) and (n+28), or
    - DTX is not observed by the SS outside the subframes (n+22) and (n+28), or
    - DTX is not observed by the SS outside the subframe (n+23), or
    - DTX is not observed by the SS outside the subframe (n+24), or
    - DTX is not observed by the SS outside the subframes (n+25) and (n+29), or
    - DTX is not observed by the SS outside the subframes (n+26) and (n+33)

- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".12. When T3 expires or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, or a fail was counted for the event “Deactivation”, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,

15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.86.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.86.4.3-1: Common Exception messages for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.86.4.3-2: *PhysicalConfigDedicated-DEFAULT* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.86.4.3-3: *CQI-ReportConfig-DEFAULT* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.86.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT* for CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.86.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.86.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.86.4.3-7: *MeasObjectEUTRA-GENERIC* for CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.86.4.3-8: *SystemInformationBlockType2* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 in FDD
}			

Table 8.16.86.4.3-9: *QuantityConfig-DEFAULT* for 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

8.16.86.5 Test Requirements

Table 8.16.85.5-1 defines the Cell specific test parameters for unknown SCell1 activation.

Table 8.16.86.5-1: Cell specific test parameters for 3DL CA Activation and Deactivation of Unknown SCell1 in Non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
Duplex mode		FDD or TDD			FDD or TDD			FDD or TDD		
TDD special subframe configuration		6			6			6		
TDD uplink-downlink configuration		1			1			1		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			- infinity	17		17		
$\hat{E}_s/I_{ot}$	dB	17			- infinity	17		17		
RSRP Note 3	dBm/15 kHz	-87			- infinity	-87		-87		
SCH_RP Note 3	dBm/15 kHz	-87			- infinity	-87		-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-76.22 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)		-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		

Timing offset to Cell 1	µs	-	0	0
Time alignment error relative to cell 1 Note 5	µs	-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 5	µs	-	-	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. he TAE value depends upon the type of carrier aggregation.
Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [16]. The same configuration applies to all TDD cells.

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+8) and (m+9) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9) and (m+15) to (m+19) for FDD PCell, and not happen outside subframes (m+5) to (m+11) and (m+20) to (m+26) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9) and (n+15) to (n+19) for FDD PCell, and not happen outside subframes (n+5) to (n+11) and (n+20) to (n+26) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

8.16.87 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

8.16.87.1 Test purpose

To verify the UE's ability to make correct reporting of Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.87.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 4DL CA. Applicability requires support for FGI bit 111.

Note: If the generic duplex-mode test case 8.16.87 is tested with FDD PCell, the specific duplex-mode test cases 8.16.51 and 8.16.53 do not need to be tested. If the generic duplex-mode test case 8.16.87 is tested with TDD PCell, the specific duplex-mode test cases 8.16.52 and 8.16.54 do not need to be tested.

8.16.87.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.87.

8.16.87.4 Test description

8.16.87.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-5 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.87.5-1 and Table 8.16.87.5-2 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A.

2. The general test parameter settings are set up according to Table 8.16.87.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.87.4.3.

5. Cell 1 is the PCell on the PCC channel 1, Cell 2 is a SCell on the SCC channel 2, Cell 3 is a SCell on the SCC channel 3, Cell 4 is a SCell on the SCC channel 4 and Cell 5 is a neighbour cell on the SCC channel 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.87.4.1-1: General test parameters for 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Neighbour cell			Cell 5	Neighbour cell to be identified on RF channel number 4.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to any TDD cells (cell1, cell2, cell3, cell4 and cell5 may be configured for FDD or TDD operation).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to any TDD cells (cell1, cell2, cell3, cell 4 and cell5 may be configured for FDD or TDD operation).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 in TS 36.133 [4] into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 in TS 36.133 [4] into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	For cell2, cell3 and cell4
T1		s	5	During this time the cell1, cell3 and cell4 shall be known to the UE; but cell2 and cell5 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event A6 for cell5 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms for cell1 and within 1.6s for each of cells2, 3 and 4.

8.16.87.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 5. At the beginning of T2 the transmission power of cell 5 is increased to the same level as for cell 4, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3, 4 and 5 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2, for Cell 3 and for Cell 4. Cells 1, 2, 3, 4 and 5 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (cell 2, cell 3 and cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.87.4.3.
4. Set the parameters according to T1 in Table 8.16.87.5-1 and Table 8.16.87.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.87.5-1 and Table 8.16.87.5-2.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
9. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.87.5-1 and Table 8.16.87.5-2.
11. The UE shall transmit MeasurementReport messages triggered by Event A2 for cell 1, cell 2, cell 3 and cell 4, respectively.
12. If the measurement reporting delay for cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.
13. If the measurement reporting delay for cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.
14. If the measurement reporting delay for cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.
15. If the measurement reporting delay for cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 4 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 4 A2 is increased by one.
16. After the SS receives the MeasurementReport message in steps 12, 13, 14 and 15 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

17. Set cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

18. Set cell 5 physical cell identity = ((current cell 5 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of cell 5 = physical cell identity of cell 4 then skip this physical cell identity value for cell 5.

19. After the RRC connection release, the SS:
    - transmits in cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

20. Repeat step 3-19 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2”, “Cell 3 A2” and “Cell 4 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.87.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.87.4.3-1: Common Exception messages for 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.87.4.3-2: *MeasConfig-DEFAULT*: Additional 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	4 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC (Cell 4) and neighbouring cell on the SCC (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	6 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		

reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A2		
measId	6		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.87.4.3-3: MeasObjectEUTRA-GENERIC: Additional 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4
}			

Table 8.16.87.4.3-4: *ReportConfig-A1*: Additional 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.87.4.3-5: *ReportConfig-A2*: Additional E-UTRAN 4 DL FDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.87.4.3-6: *MeasurementReport*: Additional E-UTRAN FDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		event “A1”
	2		event “Cell 1 A2”
	3		event “Cell 2 A2”
	4		event “Cell 3 A2”
	5		event “Cell 4 A2”
	6		event “A6”
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE { }	Not present		
measResultNeighCells CHOICE {			event “A6”
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	The same number of entries as the configured SCell(s)	*n* denotes the index of the entry	
MeasResultServFreq-r10[n] {			
servFreqId-r10	Set according to the configured SCell(s)		
measResultSCell-r10 SEQUENCE {		SCell(s)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

8.16.87.5 Test requirement

Table 8.16.87.4.1-1, Table 8.16.87.5-1 and Table 8.16.87.5-2 defines the primary level settings including test tolerances for 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes test.

Table 8.16.87.5-1: Cell specific test parameters for 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 KHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
$\hat{E}_s/I_{ot}$ [Note 3]	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
RSRP [Note 3]	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
SCH_RP [Note 3]	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
Io [Note 3]	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to cell1	µs	-			0			0		
Time alignment error relative to cell1[Note 5]	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2[Note 5]	µs	≤ TAE			-			≤ TAE		
Time alignment error relative to cell 3[Note 5]	µs	≤ TAE			≤ TAE			-		
Time alignment error relative to cell 4[Note 5]	µs	≤ TAE			≤ TAE			≤ TAE		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.87.5-2: Cell specific test parameters for E-UTRAN 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 4			Cell 5		
		T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		4					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104.5					
$\hat{E}_s/N_{oc}$	dB	17.7	17.7	-3.7	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$ Note 3	dB	17.7	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.95 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.04 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 4		
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			3		
Time alignment error relative to cell1 Note5	µs	-			N/A		
Time alignment error relative to cell 2 Note 5	µs	-			N/A		
Time alignment error relative to cell 3 Note 5	µs	-			N/A		
Time alignment error relative to cell 4 Note 5	µs	-			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for cell 2, cell 3 and cell 4 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$

- where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for cell 2, one Event A2 triggered measurement report for cell 3, and one Event A2 triggered measurement report for cell 4 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2 and Cell 4 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.16.88 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

8.16.88.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 (Neighbour becomes better than SCell) on deactivated SCell with PCell and SCell interruptions in non-DRX as defined in TS 36.133[4] within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.88.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 4DL CA. Applicability requires support for FGI bit 111.

Note: If the generic duplex-mode test case 8.16.88 is tested with FDD PCell, the specific duplex-mode test case 8.16.55 do not need to be tested. If the generic duplex-mode test case 8.16.88 is tested with TDD PCell, the specific duplex-mode test case 8.16.56 do not need to be tested.

8.16.88.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.31.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.88.

8.16.88.4 Test description

8.16.88.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-5 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.88.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate for UE with 2Rx RF band and Annex A.

2. The general test parameter settings are set up according to Table 8.16.88.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.88.4.3.

5. Cell 1 is PCell on the PCC channel 1, Cell 2 is the SCell on the SCC channel 2, Cell 3 is SCell on the SCC channel 3, Cell 4 is SCell on the SCC channel 4 and Cell 5 is the neighbour cell on the SCC channel 4. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.88.4.1-1: General test parameters for E-UTRAN 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4	Four radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Neighbour cell			Cell 5	Neighbour cell to be identified on RF channel number 4.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to any TDD cells (cell1, cell2, cell3, cell4 and cell5 may be configured for FDD or TDD operation).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to any TDD cells (cell1, cell2, cell3, cell 4 and cell5 may be configured for FDD or TDD operation).
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 in TS 36.133 [4] into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2, 3 and 4 but not cell 5.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.88.4.2 Test procedure

There are five cells: Cell 1, Cell 2, Cell 3, Cell 4 and Cell 5. Cell 1 is PCell on the primary component (RF Channel 1), Cell 2 is SCell on the secondary component (RF Channel 2), Cell 3 is SCell on the secondary component (RF Channel 3), Cell 4 is SCell on the secondary component (RF Channel 4) and Cell 5 is the neighbour cell on the secondary component (RF Channel 4). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, Cell2, Cell3 and Cell4 are deactivated. During T1 the UE shall not have any information of Cell 5. Immediately at beginning of T2 the transmission power of Cell 5 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. Cells 1, 2, 3, 4 and 5 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell Cell 2, SCell Cell 3 and SCell Cell 4 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.88.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.88.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.88.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).

10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.88.5-1.

11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.

12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 5 physical cell identity = ((current cell 5 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 5 = physical cell identity of Cell 4 then skip this physical cell identity value for Cell 5.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.88.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.88.4.3-1: Common Exception messages for 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.88.4.3-2: *MeasConfig-DEFAULT*: Additional 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	4 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC3 (Cell 4)and neighbouring cell on the SCC3 (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		

speedStatePars	Not present		
}			

Table 8.16.88.4.3-3: *MeasObjectEUTRA-GENERIC*: Additional 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4, Cell 5
offsetFreq	0 (dB 0)		
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
measCycleSCell-r10	sf640		Cell 2, Cell 3, Cell 4
measSubframePatternConfigNeigh-r10	Not present		
}			

Table 8.16.88.4.3-4: MeasurementReport: Additional 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 5	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	3 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[3] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			

}			
}			
}			

Table 8.16.88.4.3-5: *SystemInformationBlockType2*: Additional 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1, Cell 2 in FDD
}			

Table 8.16.88.4.3-7: *SystemInformationBlockType5*: Additional 4 DL CA Event Triggered Reporting on

Table 8.16.88.4.3-6: *RadioResourceConfigCommonSCell-r10*: Additional 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-2 RadioResourceConfigCommonSCell-r10-DEFAULT exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
mbsfn-SubframeConfigList-r10	Not present		Cell2 in FDD
}			
}			

8.16.88.5 Test requirement

Table 8.16.88.4.1-1, Table 8.16.88.5-1 and Table 8.16.88.5-2 define the primary level settings including test tolerances for 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes test.

Table 8.16.88.5-1: Cell specific test parameters for E-UTRAN 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes (Cell #1, Cell #2, Cell #3, Cell #4)

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				4			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in Annex D		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD				5MHz: OP.19 FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP. 19 FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP. 19 FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			

						5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD								
PBCH_RA	dB	0				0				0				0			
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA Note 1	dB																
OCNG_RB Note 1	dB																
N_{oc} Note 3	dBm/15 kHz	-101				-101				-101				-101			
$\hat{E}_s / N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
$\hat{E}_s / I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				0			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				≤ TAE			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				≤ TAE			

Time alignment error relative to cell 3 Note 5	µs	-	-	-	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 from the start of time period T2 and on cell2 from the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.88.5-2: Cell specific test parameters for E-UTRAN 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes(Cell #5)

Parameter	Unit	Cell 5			
		T1	T2	T3	T4
E-UTRA RF Channel Number		4			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		N/A			
PCFICH/PDCCH/PHICH parameters defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in Annex D		5MHz: OP. 16 FDD 10MHz: OP. 2 FDD 20MHz: OP. 12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
PBCH_RA	dB	0			
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-101			
$\hat{E}_s / N_{oc}$	dB	-infinity	16	-infinity	16
$\hat{E}_s / I_{ot}$ Note 4	dB	-infinity	-0.11	-infinity	-0.11
RSRP Note 4	dBm/15 kHz	-infinity	-85	-infinity	-85
SCH_RP Note 4	dBm/15 kHz	-infinity	-85	-infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			
Antenna Configuration		1x2			
Timing offset to Cell 1	µs	3			
Time alignment error relative to cell 1 Note 5	µs	N/A			
Time alignment error relative to cell 2 Note 5	µs	N/A			
Time alignment error relative to cell 3 Note 5	µs	N/A			
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.					

Note 2:	Void
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 5.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 5.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.89 4 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

8.16.89.1 Test Purpose

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with three downlink SCells, when the SCell is known by the UE at the time of activation.

8.16.89.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 25.

This test also applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD, E-UTRA TDD and 4DL CA. If the generic duplex-mode test case 8.16.89 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.89 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell. Applicability requires support for FGI bit 25.

Note on the applicability: If the generic duplex-mode test case 8.16.89 is tested with FDD PCell, the specific duplex-mode test cases 8.16.57 and 8.16.59 do not need to be tested. If the generic duplex-mode test case 8.16.89 is tested with TDD PCell, the specific duplex-mode test cases 8.16.58 and 8.16.60 do not need to be tested.

8.16.89.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.89.

8.16.89.4 Test description

8.16.89.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.89.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.89.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.89.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3 and Cell 4 is the deactivated SCell on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.89.4.1-1: General test parameters for 4DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, and SCell3.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, and SCell3.

8.16.89.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and Cell 4 (deactivated SCell3) on radio channel 4 (SCC3) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

There are four carriers, each with one cell. Cell 1, Cell 2, Cell 3 and Cell 4 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 and SCell3 (Cell 4) on the SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.89.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.89.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.89.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives

ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 in subframe (m+10) for FDD PCell and (m+15) for TDD PCell and SCell 3 in subframe (m+20) for FDD PCell and (m+15) for TDD PCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells.

   8a. For all intra-band PCell FDD case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC(FDD) and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+15) to (m+23) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+25) to (m+33) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8d. For all intra-band PCell TDD case

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34).
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34),
- and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframes (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34),
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 in subframe (n+10) for FDD PCell and (n+15) for TDD PCell and SCell 3 in subframe (n+20) for FDD PCell and (n+30) for TDD PCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    11a. For all intra-band PCell FDD case

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For the case where the band relation between PCC(FDD) and SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes

(n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+25) to (n+33) up to the end of T3

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+25) to (n+33) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11d. For all intra-band PCell TDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13), the subframes (n+20) to (n+24) and (n+28) and the subframes (n+35) to (n+39) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14), the subframes (n+21) to (n+25) and (n+28) to (n+29) and the subframe (n+36) to (n+40) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18), the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33) and the subframes (n+37) to (n+41) and (n+43), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20), (n+24), (n+35) and (n+39), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21), (n+28), (n+36) and (n+43) up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22), (n+28), (n+37) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25), (n+29), (n+40) and (n+44), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26), (n+33), (n+41) and (n+48) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13)
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14),
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
- and DTX is not observed by the SS outside the subframes (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+26) and (n+33), up to the end of T3,
- and DTX is not observed by the SS outside the subframes (n+35) and (n+39), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+36) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+37) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+38), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+39), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+40) and (n+44), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+41) and (n+48), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.89.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.89.4.3-1: Common Exception messages for 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.89.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.89.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.89.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.89.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path:TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.89.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.89.4.3-7: *QuantityConfig-DEFAULT:* Additional 4DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.89.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4
}			

Table 8.16.89.4.3-9: *SystemInformationBlockType2:* Additional 4DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 in FDD
}			

8.16.89.5 Test Requirements

Table 8.16.89.5-1 and 8.16.89.5-2 define the Cell specific test parameters for known SCell1 activation.

Table 8.16.89.5-1: Cell specific test parameters for known SCell1 activation

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
Duplex mode		FDD or TDD			FDD or TDD			FDD or TDD		
TDD Special subframe configuration		6			6			6		
TDD Uplink-downlink configuration		1			1			1		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	μs	-			0			0		
Time alignment error relative to cell 1 Note 5	μs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	μs	-			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	μs	-			-			-		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.89.5-2: Cell specific test parameters for known SCell1 activation

Parameter	Unit	Cell 4								
		T1	T2	T3						
E-UTRA RF Channel Number		4								
Duplex mode		FDD or TDD								
TDD Special subframe configuration		6								
TDD Uplink-downlink configuration		1								
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100								
PDSCH parameters: DL Reference Measurement Channel		-								
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD								
OCNG Patterns		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD								
PBCH_RA	dB	0								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104								
$\hat{E}_s/N_{oc}$	dB	17								
$\hat{E}_s/I_{ot}$	dB	17								
RSRP Note 3	dBm/15 kHz	-87								
SCH_RP Note 3	dBm/15 kHz	-87								
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)								
Propagation Condition		AWGN								
Antenna Configuration		1x2								
Timing offset to Cell 1	µs	0								
Time alignment error relative to cell 1 Note 5	µs	≤ TAE								
Time alignment error relative to cell 2 Note 5	µs	≤ TAE								
Time alignment error relative to cell 3 Note 5	µs	≤ TAE								

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell1 in subframe (m+8), or in subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+8) and (m+9) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+34).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9), (m+15) to (m+19) and (m+25) to (m+29) for FDD PCell, and not outside subframes (m+5) to (m+11) and (m+20) to (m+26) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9), (n+15) to (n+19) and (n+25) to (n+29) for FDD PCell, and not outside subframes (n+5) to (n+11), (n+20) to (n+26) and (n+35) to (n+41) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+34) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

8.16.90 4 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

8.16.90.1 Test Purpose

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with three downlink SCells, when the SCell is unknown by the UE at the time of activation.

8.16.90.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA. Applicability requires support for FGI bit 25.

This test also applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD, E-UTRA TDD and 4DL CA. If the generic duplex-mode test case 8.16.90 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.90 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell. Applicability requires support for FGI bit 25.

Note on the applicability: If the generic duplex-mode test case 8.16.90 is tested with FDD PCell, the specific duplex-mode test cases 8.16.61 and 8.16.63 do not need to be tested. If the generic duplex-mode test case 8.16.90 is tested with TDD PCell, the specific duplex-mode test cases 8.16.62 and 8.16.64 do not need to be tested.

8.16.90.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.90.

8.16.90.4 Test description

8.16.90.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.90.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.90.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.90.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3 and Cell 4 is the deactivated SCell on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.90.4.1-1: General test parameters for 4DL CA activation and deactivation of unknown SCell in non-DRX with generic duplex modes

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, and SCell3.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, and SCell3.

8.16.90.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and Cell 4 (deactivated SCell3) on radio channel 4 (SCC3) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

There are four carriers, each with one cell. Cell 1, Cell 2, Cell 3 and Cell 4 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 and SCell3 (Cell 4) on the SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.90.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.90.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.90.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives

ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 in subframe (m+10) for FDD PCell and (m+15) for TDD PCell and SCell 3 in subframe (m+20) for FDD PCell and (m+30) for TDD PCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells.

   8a. For all intra-band PCell FDD case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC(FDD) and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,
   - and $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+15) to (m+23) and $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+25) to (m+33) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,
   - and $\leq$2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) and $\leq$2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8d. For all intra-band PCell TDD case

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44).
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28) and the subframes (m+35) to (m+39) and (m+43) up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29) and the subframe (m+36) to (m+40) and (m+43), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18), the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33) and the subframe (m+37) to (m+41) and (m+43), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44),
- and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20), (m+24), (m+35) and (m+39), up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+6), (m+13), (m+21), (m+28), (m+36) and (m+43), up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+7), (m+13), (m+22), (m+28), (m+37) and (m+43), up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+8) and (m+23) up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+9) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+10), (m+14), (m+25), (m+29) and (m+40) up to the end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+11), (m+18), (m+26), (m+33), (m+41) and (m+43), up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframes (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44),
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- and DTX is not observed by the SS anywhere outside the subframes (m+35) and (m+39), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+36) and (m+43), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+37) and (m+43), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+38), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+39), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+40), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (m+41), up to end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 in subframe (n+10) for FDD PCell and (n+15) for TDD PCell and SCell 3 in subframe (n+20) for FDD PCell and (n+30) for TDD PCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

11a. For all intra-band PCell FDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11b. For the case where the band relation between PCC(FDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+25) to (n+33) up to the end of T3
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+25) to (n+33) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11d. For all intra-band PCell TDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13), the subframes (n+20) to (n+24) and (n+28) and the subframes (n+35) to (n+39) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14), the subframes (n+21) to (n+25) and (n+28) to (n+29) and the subframe (n+36) to (n+40) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18), the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33) and the subframes (n+37) to (n+41) and (n+43), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20), (n+24), (n+35) and (n+39), up to the end of T3,

- or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21), (n+28), (n+36) and (n+43) up to the end of T3,
- or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22), (n+28), (n+37) and (n+43), up to the end of T3,
- or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,
- or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,
- or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25), (n+29), (n+40) and (n+44), up to the end of T3,
- or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26), (n+33), (n+41) and (n+48) up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13)
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14),
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
- and DTX is not observed by the SS outside the subframes (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+26) and (n+33), up to the end of T3,
- and DTX is not observed by the SS outside the subframes (n+35) and (n+39), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+36) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+37) and (n+43), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+38), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+39), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+40) and (n+44), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+41) and (n+48), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.90.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.90.4.3-1: Common Exception messages for 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.90.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_Add Mod
}			

Table 8.16.90.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.90.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.90.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path:TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.90.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.90.4.3-7: *QuantityConfig-DEFAULT:* Additional 4DL CA Activation and Deactivation of Unknown SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.90.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4
}			

Table 8.16.90.4.3-9: *SystemInformationBlockType2:* Additional 4DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 in FDD
}			

8.16.90.5 Test Requirements

Table 8.16.90.5-1 and 8.16.90.5-2 define the Cell specific test parameters for unknown SCell1 activation.

Table 8.16.90.5-1: Cell specific test parameters for unknown SCell1 activation

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1	2	3
Duplex mode		FDD or TDD	FDD or TDD	FDD or TDD
TDD Special subframe configuration		6	6	6
TDD Uplink-downlink configuration		1	1	1
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-104	-104	-104
$\hat{E}_s/N_{oc}$	dB	17	17	17
$\hat{E}_s/I_{ot}$	dB	17	17	17
RSRP Note 3	dBm/15 kHz	-87	-87	-87
SCH_RP Note 3	dBm/15 kHz	-87	-87	-87
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN	AWGN
Antenna Configuration		1x2	1x2	1x2
Timing offset to Cell 1	µs	-	0	0
Time alignment error relative to cell 1 Note 5	µs	-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 5	µs	-	-	≤ TAE
Time alignment error relative to cell 3 Note 5	µs	-	-	-

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.90.5-2: Cell specific test parameters for unknown SCell1 activation

Parameter	Unit	Cell 4								
		T1	T2	T3						

E-UTRA RF Channel Number		4		
Duplex mode		FDD or TDD		
TDD Special subframe configuration		6		
TDD Uplink-downlink configuration		1		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-104		
$\hat{E}_s/N_{oc}$	dB	17		
$\hat{E}_s/I_{ot}$	dB	17		
RSRP Note 3	dBm/15 kHz	-87		
SCH_RP Note 3	dBm/15 kHz	-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN		
Antenna Configuration		1x2		
Timing offset to Cell 1	µs	0		
Time alignment error relative to cell 1 Note 5	µs	≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+8) and (m+9) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+44).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9), (m+15) to (m+19) and (m+25) to (m+29) for FDD PCell, and not outside subframes (m+5) to (m+11), (m+20) to (m+26) and (m+35) to (m+41) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9), (n+15) to (n+19) and (n+25) to (n+29) for FDD PCell, and not outside subframes (n+5) to (n+11), (n+20) to (n+26) and (n+35) to (n+41) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+44) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

8.16.91 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

8.16.91.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.91.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 5DL CA. Applicability requires support for FGI bit 111.

Note: If the generic duplex-mode test case 8.16.91 is tested with FDD PCell, the specific duplex-mode test cases 8.16.65 and 8.16.71 do not need to be tested. If the generic duplex-mode test case 8.16.91 is tested with TDD PCell, the specific duplex-mode test cases 8.16.66 and 8.16.72 do not need to be tested.

8.16.91.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.91.

8.16.91.4 Test description

8.16.91.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.91.5-1 and Table 8.16.91.5-2 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.91.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.91.4.3.
5. Cell 1 is the PCell on the PCC channel 1, Cell 2 is a SCell on the SCC channel 2, Cell 3 is a SCell on the SCC channel 3, Cell 4 is a SCell on the SCC channel 4, Cell 5 is a SCell on the SCC channel 5 and Cell 6 is a neighbour cell on the SCC channel 5. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 shall be powered OFF.

Table 8.16.91.4.1-1: General test parameters for E-UTRAN 5 DL CA event triggered reporting under fading propagation conditions with 4 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4, 5	Five radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell			Cell 5	Configured deactivated secondary cell on RF channel number 5.
Neighbour cell			Cell 6	Neighbour cell to be identified on RF channel number 5.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5 and cell6).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5 and cell6).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 in TS 36.133 [4] into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 in TS 36.133 [4] into account plus margin.
	Time To Trigger	s	0	

A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 5		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	For cell2, cell3, cell4 and cell5
T1		s	5	During this time the cell1, cell3, cell4 and cell5 shall be known to the UE; but cell2 and cell6 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event A6 for cell6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms for cell1 and within 1.6s for each of cells 2, 3, 4 and 5.

8.16.91.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on Cell 6. At the beginning of T2 the transmission power of Cell 6 is increased to the same level as for Cell 5, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of Cell 2 is increased to the same level as for Cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of Cells 1, 2, 3, 4, 5 and 6 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2, for Cell 3, for Cell 4 and for Cell 5. Cells 1, 2, 3, 4, 5 and 6 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4 and Cell 5) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.91.4.3.
4. Set the parameters according to T1 in Table 8.16.91.5-1 and Table 8.16.91.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.91.5-1 and Table 8.16.91.5-2.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
9. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.

10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.91.5-1 and Table 8.16.91.5-2.

11. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1, Cell 2, Cell 3, Cell 4 and Cell 5, respectively.

12. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

13. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

14. If the measurement reporting delay for Cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.

15. If the measurement reporting delay for Cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 4 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 4 A2 is increased by one.

16. If the measurement reporting delay for Cell 5 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 5 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 5 A2 is increased by one.

17. After the SS receives the MeasurementReport message in steps 12, 13, 14, 15 and 16 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

18. Set Cell 2 physical cell identity = ((current Cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

19. Set Cell 6 physical cell identity = ((current Cell 6 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 6 = physical cell identity of Cell 5 then skip this physical cell identity value for Cell 6.

20. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

21. Repeat step 3-20 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2”, “Cell 3 A2”, “Cell 4 A2” and “Cell 5 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.91.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.91.4.3-1: Common Exception messages for 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.91.4.3-2: *MeasConfig-DEFAULT*: Additional 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	5 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
MeasObjectToAddMod[5] SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the SCell on the SCC (Cell 5) and neighbouring cell on the SCC (Cell 6)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f5)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	7 entries		
measId	1		

measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A2		
measId	6		
measObjectId	IdMeasObject-f5		
reportConfigId	idReportConfig-A2		
measId	7		
measObjectId	IdMeasObject-f5		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.91.4.3-3: MeasObjectEUTRA-GENERIC: Additional 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4, Cell 5
}			

Table 8.16.91.4.3-4: *ReportConfig-A1*: Additional 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.91.4.3-5: *ReportConfig-A2*: Additional 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.91.4.3-6: *MeasurementReport*: Additional 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		event “A1”
	2		event “Cell 1 A2”
	3		event “Cell 2 A2”
	4		event “Cell 3 A2”
	5		event “Cell 4 A2”
	6		event “Cell 5 A2”
	7		event “A6”
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE { }	Not present		
measResultNeighCells CHOICE {			event “A6”
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	The same number of entries as the configured SCell(s)	*n* denotes the index of the entry	
MeasResultServFreq-r10[n] {			
servFreqId-r10	Set according to the configured SCell(s)		
measResultSCell-r10 SEQUENCE {		SCell(s)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

8.16.91.5 Test requirement

Table 8.16.91.4.1-1, Table 8.16.91.5-1 and Table 8.16.91.5-2 defines the primary level settings including test tolerances for 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes tests.

Table 8.16.91.5-1: Cell specific test parameters for E-UTRAN 5 DL CA event triggered reporting under fading propagation conditions with 4 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 KHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
$\hat{E}_s/I_{ot}$ [Note 3]	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
RSRP [Note 3]	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
SCH_RP [Note 3]	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
Io [Note 3]	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell1[Note 5]	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 [Note 5]	µs	≤ TAE			-			≤ TAE		
Time alignment error relative to cell 3[Note 5]	µs	≤ TAE			≤ TAE			-		
Time alignment error relative to cell 4[Note 5]	µs	≤ TAE			≤ TAE			≤ TAE		
Time alignment error relative to cell 5[Note 5]	µs	≤ TAE			≤ TAE			≤ TAE		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.91.5-2: Cell specific test parameters for E-UTRAN 5 DL CA event triggered reporting under fading propagation conditions with 4 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 4			Cell 5			Cell 6		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		4			5					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 KHz	-104			-104					
$\hat{E}_s/N_{oc}$	dB	17.2	17.2	-3.2	17.7	17.7	-3.7	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$ [Note 3]	dB	17.2	17.2	-3.2	17.7	0.61	-5.24	-infinity	-0.77	-5.24
RSRP [Note 3]	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
SCH_RP [Note 3]	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
Io [Note 3]	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.95 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.04 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 5		
Propagation Condition		ETU70			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			0			3		
Time alignment error relative to cell1[Note 5]	µs	-			-			NA		
Time alignment error relative to cell2[Note 5]	µs	-			-			NA		
Time alignment error relative to cell3[Note 5]	µs	-			-			NA		
Time alignment error relative to cell4[Note 5]	µs	-			-			NA		
Time alignment error relative to cell5[Note 5]	µs	-			-			NA		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for Cell 2, Cell 3, Cell 4 and Cell 5 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$
- where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2, one Event A2 triggered measurement report for Cell 3, and one Event A2 triggered measurement report for cell with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2, Cell 4 Event A2 and Cell 5 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.16.92 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

8.16.92.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 (Neighbour becomes better than SCell) on deactivated SCell with PCell and SCell interruptions in non-DRX as defined in TS 36.133[4] within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.92.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 5DL CA. Applicability requires support for FGI bit 111.

Note: If the generic duplex-mode test case 8.16.92 is tested with FDD PCell, the specific duplex-mode test case 8.16.73 do not need to be tested. If the generic duplex-mode test case 8.16.91 is tested with TDD PCell, the specific duplex-mode test case 8.16.74 do not need to be tested.

8.16.92.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.31.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.92.

8.16.92.4 Test description

8.16.92.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.92.5-1 and Table 8.16.92.5-2 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.92.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.92.4.3.

5. Cell 1 is PCell on the PCC channel 1, Cell 2 is the SCell on the SCC channel 2, Cell 3 is SCell on the SCC channel 3, Cell 4 is SCell on the SCC channel 4, Cell 5 is SCell on the SCC channel 5 and Cell 6 is the neighbour cell on the SCC channel 5. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 shall be powered OFF.

Table 8.16.92.4.1-1: General test parameters for E-UTRAN 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4, 5	Four radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell			Cell 5	Configured deactivated secondary cell on RF channel number 5.
Neighbour cell			Cell 6	Neighbour cell to be identified on RF channel number 5.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5 and cell6).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5 and cell6).
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 in TS 36.133 [4] into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 5		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2, 3, 4 and 5 but not cell 6.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.92.4.2 Test procedure

There are six cells: Cell 1, Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6. Cell 1 is PCell on the primary component (RF Channel 1), Cell 2 is SCell on the secondary component (RF Channel 2), Cell 3 is SCell on the secondary component (RF Channel 3), Cell 4 is SCell on the secondary component (RF Channel 4), Cell 5 is SCell on the secondary component (RF Channel 5) and Cell 6 is the neighbour cell on the secondary component (RF Channel 4). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, Cell2, Cell3, Cell4 and Cell5 are deactivated. During T1 the UE shall not have any information of Cell 6. Immediately at beginning of T2 the transmission power of Cell 6 is increased to same level as for Cell 5, and due to usage of an offset this shall result in reporting of Event A6. Cells 1, 2, 3, 4, 5 and 6 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell Cell 2, SCell Cell 3, SCell Cell 4 and SCell Cell 5 on the SCCs (RF Channel 2, RF Channel 3 and RF Channel 4) as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.92.5-1 and Table 8.16.92.5-2 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.92.5-1 and Table 8.16.92.5-2.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.92.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).

10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.92.5-1 and Table 8.16.92.5-2.

11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.

12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 6 physical cell identity = ((current cell 6 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 6 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 6.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.92.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.92.4.3-1: Common Exception messages for 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.92.4.3-2: *MeasConfig-DEFAULT*: Additional 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	5 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC3 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
MeasObjectToAddMod[5] SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the SCell on the SCC4 (Cell 5)and neighbouring cell on the SCC6 (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f5)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f4		

reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.92.4.33-: MeasurementReport: Additional 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 6	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	3 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[3] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[3] {			
servFreqId-r10	4		
measResultSCell-r10 SEQUENCE {		SCell Cell 5	
rsrpResultSCell-r10	(0..97)	Set according to	

		specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.92.4.3-4: *SystemInformationBlockType2*: Additional 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1, Cell 2
}			

Table 8.16.92.4.3-5: *RadioResourceConfigCommonSCell-r10*: Additional 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-2 RadioResourceConfigCommonSCell-r10-DEFAULT exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
mbsfn-SubframeConfigList-r10	Not present		Cell2 in FDD
}			
}			

8.16.92.5 Test requirement

Table 8.16.92.4.1-1, Table 8.16.92.5-1 and Table 8.16.92.5-2 define the primary level settings including test tolerances for 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes test.

Table 8.16.92.5-1: Cell specific test parameters for E-UTRAN 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes (Cell #1, Cell #2, Cell #3, Cell #4)

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				4			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in Annex D		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD				5MHz: OP.19 FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP. 19 FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP19. FDD 10MHz: OP. 6 FDD 20MHz: OP. 14 FDD	5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			

						5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD								
PBCH_RA	dB	0				0				0				0			
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA Note 1	dB																
OCNG_RB Note 1	dB																
N_{oc} Note 3	dBm/15 kHz	-101				-101				-101				-101			
$\hat{E}_s / N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
$\hat{E}_s / I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	16	-0.11	16	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	μs	-				0				0				0			
Time alignment error relative to cell 1 Note 5	μs	-				≤ TAE				≤ TAE				≤ TAE			
Time alignment error relative to cell 2 Note 5	μs	-				-				≤ TAE				≤ TAE			
Time alignment error	μs	-				-				-				≤ TAE			

relative to cell 3 Note 5					

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 from the start of time period T2 and on cell2 from the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.92.5-2: Cell specific test parameters for E-UTRAN 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes (Cell #5, Cell #6)

Parameter	Unit	Cell 5				Cell 6			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		5				5			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		N/A				N/A			
PCFICH/PDCCH/PHICH parameters defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
PBCH_RA	dB	0				0			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 3	dBm/15 kHz	-101				-101			
$\hat{E}_s / N_{oc}$	dB	16	16	16	16	-infinity	16	-infinity	16
$\hat{E}_s / I_{ot}$ Note 4	dB	16	-0.11	16	-0.11	-infinity	-0.11	-infinity	-0.11
RSRP Note 4	dBm/15 kHz	85	-85	85	-85	-infinity	-85	-infinity	-85
SCH_RP Note 4	dBm/15 kHz	85	-85	85	-85	-infinity	-85	-infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN			
Antenna Configuration		1x2				1x2			
Timing offset to Cell 1	µs	0				3			
Time alignment error relative to cell 1 Note 5	µs	≤ TAE				N/A			
Time alignment error relative to cell 2 Note 5	µs	≤ TAE				N/A			
Time alignment error relative to cell 3 Note 5	µs	≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Void
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 6.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 6.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.93 5 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

8.16.93.1 Test Purpose

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with four downlink SCells, when the SCell is known by the UE at the time of activation.

8.16.93.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 25.

This test also applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD, E-UTRA TDD and 5DL CA. If the generic duplex-mode test case 8.16.93 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.93 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell. Applicability requires support for FGI bit 25.

Note on the applicability: If the generic duplex-mode test case 8.16.93 is tested with FDD PCell, the specific duplex-mode test cases 8.16.75 and 8.16.77 do not need to be tested. If the generic duplex-mode test case 8.16.93 is tested with TDD PCell, the specific duplex-mode test cases 8.16.76 and 8.16.78 do not need to be tested.

8.16.93.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or

- the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.93.

8.16.93.4 Test description

8.16.93.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.93.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.93.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.93.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3, Cell 4 is the deactivated SCell on RF channel number 4 and Cell 5 is the deactivated SCell on RF channel number 5. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.93.4.1-1: General test parameters for 5DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4, 5	Five radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell4		Cell 5	Configured deactivated secondary cell on RF channel number 5.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Cell-individual offset for cells on RF channel number 5	dB	0	Individual offset for cells on SCC4.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell, SCell2, SCell3 and SCell4 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, SCell3 and SCell4.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, SCell3 and SCell4.

8.16.93.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), Cell 4 (deactivated SCell3) on radio channel 4 (SCC3) and Cell 5 (deactivated SCell4) on radio channel 5 (SCC4) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2, SCC3 and SCC4. The UE shall be continuously scheduled in the PCell throughout the whole test.

There are five carriers, each with one cell. Cell 1, Cell 2, Cell 3, Cell 4 and Cell 5 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2, SCC3 and SCC4 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2, SCell3 (Cell 4) on the SCC3 and SCell4 (Cell 5) on the SCC4 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.93.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.93.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.93.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 in subframe (m+10) for FDD PCell and (m+15) for TDD PCell, SCell 3 in subframe (m+20) for FDD PCell and (m+15) for TDD PCell and SCell 4 in subframe (m+30) for FDD PCell and (m+15) for TDD PCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells.

   8a. For all intra-band PCell FDD case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC(FDD) and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+15) to (m+23), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+25) to (m+33) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+35) to (m+43) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+35) to (m+43) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8d. For all intra-band PCell TDD case

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34).
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34),
- and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframes (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,

- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34),
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 in subframe (n+10) for FDD PCell and (n+15) for TDD PCell, SCell 3 in subframe (n+20) for FDD PCell and (n+30) for TDD PCell and SCell 4 in subframe (n+30) for FDD PCell and (n+45) for TDD PCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    11a. For all intra-band PCell FDD case

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and (n+35) to (n+43) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For the case where the band relation between PCC(FDD) and SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and the subframes (n+35) to (n+43) up to the end of T3,
    - and $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+15) to (n+23), $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+25) to (n+33) and $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+35) to (n+43) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

- and DTX is not observed by the SS outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and the subframes (n+35) to (n+43) and up to the end of T3,

- and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+25) to (n+33) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+35) to (n+43), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11d. For all intra-band PCell TDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+9) and (n+13), the subframes (n+20) to (n+24) and (n+28), the subframes (n+35) to (n+39) and (n+43) and the subframes (n+50) to (n+54) and (n+58) up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+6) to (n+10) and (n+13) to (n+14), the subframes (n+21) to (n+25) and (n+28) to (n+29) , the subframes (n+36) to (n+40) and (n+43) and subframes (n+51) to (n+55) and (n+58) up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18), the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33) , the subframes (n+37) to (n+41) and (n+43) and subframes (n+52) to (n+56) and (n+58) up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

  - and DTX is not observed by the SS anywhere outside the subframes (n+5), (n+9), (n+20), (n+24), (n+35), (n+39), (n+50) and (n+54) up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+6), (n+13), (n+21), (n+28), (n+36), (n+43), (n+51) and (n+58), up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+7), (n+13), (n+22), (n+28), (n+37), (n+43), (n+52) and (n+58), up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+8) and (n+23), up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+9) and (n+24), up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+10), (n+14), (n+25), (n+29), (n+40), (n+44) and (n+55), up to the end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+11), (n+18), (n+26), (n+33), (n+41), (n+48), (n+56) and (n+58), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+9) and (n+13),

  - or DTX is not observed by the SS anywhere outside the subframes (n+6) to (n+10) and (n+13) to (n+14)

  - or DTX is not observed by the SS anywhere outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),

- and DTX is not observed by the SS anywhere outside the subframes (n+20) and (n+24), up to end of T3,

  - or DTX is not observed by the SS anywhere outside the subframes (n+21) and (n+28), up to end of T3,

- or DTX is not observed by the SS anywhere outside the subframes (n+22) and (n+28), up to end of T3,
- or DTX is not observed by the SS anywhere outside the subframes (n+23), up to end of T3,
- or DTX is not observed by the SS anywhere outside the subframes (n+24), up to end of T3,
- or DTX is not observed by the SS anywhere outside the subframes (n+25) and (n+29), up to end of T3,
- or DTX is not observed by the SS anywhere outside the subframes (n+26) and (n+33), up to end of T3,

- and DTX is not observed by the SS anywhere outside the subframes (n+35) and (n+39), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+36) and (n+43), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+37) and (n+43), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+38), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+39), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+40) and (n+44), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+41) and (n+48), up to end of T3,
- and DTX is not observed by the SS anywhere outside the subframes (n+50) and (n+54), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+51) and (n+58), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+52) and (n+58), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+53), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+54), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+55), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+56), up to end of T2,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.93.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.93.4.3-1: Common Exception messages for 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.93.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.93.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.93.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.93.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path:TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.93.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.93.4.3-7: *QuantityConfig-DEFAULT:* Additional 5DL CA Activation and Deactivation of Known SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.93.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4, Cell 5
}			

Table 8.16.93.4.3-9: *SystemInformationBlockType2:* Additional 5DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 in FDD
}			

8.16.93.5 Test Requirements

Table 8.16.93.5-1 and 8.16.93.5-2 define the Cell specific test parameters for known SCell1 activation.

Table 8.16.93.5-1: Cell specific test parameters for known SCell1 activation

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
Duplex mode		FDD or TDD			FDD or TDD			FDD or TDD		
TDD Special subframe configuration		6			6			6		
TDD Uplink-downlink configuration		1			1			1		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	-			-			-		

Time alignment error relative to cell 4 Note 5	µs	-	-	-

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.93.5-2: Cell specific test parameters for known SCell1 activation

Parameter	Unit	Cell 4			Cell 5					
		T1	T2	T3	T1	T2	T3			
E-UTRA RF Channel Number		4			5					
Duplex mode		FDD or TDD			FDD or TDD					
TDD Special subframe configuration		6			6					
TDD Uplink-downlink configuration		1			1					
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		-			-					
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD					
OCNG Patterns		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD					
PBCH_RA	dB	0			0					
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104					
$\hat{E}_s/N_{oc}$	dB	17			17					
$\hat{E}_s/I_{ot}$	dB	17			17					
RSRP Note 3	dBm/15 kHz	-87			-87					
SCH_RP Note 3	dBm/15 kHz	-87			-87					
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)					
Propagation Condition		AWGN			AWGN					
Antenna Configuration		1x2			1x2					
Timing offset to Cell 1	µs	0			0					
Time alignment error relative to cell 1 Note 5	µs	≤ TAE			≤ TAE					
Time alignment error relative to cell 2 Note 5	µs	≤ TAE			≤ TAE					
Time alignment error relative to cell 3 Note 5	µs	≤ TAE			≤ TAE					
Time alignment error relative to cell 4 Note 5	µs	-			≤ TAE					

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+8) and (m+9) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9), (m+15) to (m+19), (m+25) to (m+29) and (m+35) to (m+39) for FDD PCell, and not outside subframes (m+5) to (m+11) and (m+20) to (m+26) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9), (n+15) to (n+19), (n+25) to (n+29) and (n+35) to (n+39) for FDD PCell, and not outside subframes (n+5) to (n+11), (n+20) to (n+26), (n+35) to (n+41) and (n+50) to (n+56) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

8.16.94 5 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

8.16.94.1 Test Purpose

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] section 7.7 for UE configured with four downlink SCells, when the SCell is unknown by the UE at the time of activation.

8.16.94.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA. Applicability requires support for FGI bit 25.

This test also applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD, E-UTRA TDD and 5DL CA. If the generic duplex-mode test case 8.16.94 is tested with FDD PCell, it will be only applicable to UEs supporting FDD as PCell. If the generic duplex-mode test case 8.16.94 is tested with TDD PCell, it will only be applicable to UEs supporting TDD as PCell. Applicability requires support for FGI bit 25.

Note on the applicability: If the generic duplex-mode test case 8.16.94 is tested with FDD PCell, the specific duplex-mode test cases 8.16.67 and 8.16.69 do not need to be tested. If the generic duplex-mode test case 8.16.94 is tested with TDD PCell, the specific duplex-mode test cases 8.16.68 and 8.16.70 do not need to be tested.

8.16.94.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.94.

8.16.94.4 Test description

8.16.94.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.94.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without intra-frequency neighbours. For PCell, use the 4Rx module if the UE supports 4Rx for the corresponding band and the 2Rx module otherwise. For all other cells, the 2Rx module can be used.

2. The general test parameter settings are set up according to Table 8.16.94.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.94.4.3.

5. Cell 1 is the PCell on the primary component carrier, Cell 2 is SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3, Cell 4 is the deactivated SCell on RF channel number 4 and Cell 5 is the deactivated SCell on RF channel number 5. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.94.4.1-1: General test parameters for 5DL CA Activation and Deactivation of Unknown SCell in non-DRX with generic duplex modes

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4, 5	Five radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell4		Cell 5	Configured deactivated secondary cell on RF channel number 5.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Cell-individual offset for cells on RF channel number 5	dB	0	Individual offset for cells on SCC4.
Filter coefficient		0	L3 filtering is not used.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell, SCell2, SCell3 and SCell4 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, SCell3 and SCell4.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, SCell3 and SCell4.

8.16.94.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), Cell 4 (deactivated SCell3) on radio channel 4 (SCC3) and Cell 5 (deactivated SCell4) on radio channel 5 (SCC4) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2, SCC3 and SCC4. The UE shall be continuously scheduled in the PCell throughout the whole test.

There are five carriers, each with one cell. Cell 1, Cell 2, Cell 3, Cell 4 and Cell 5 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2, SCC3 and SCC4 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2, SCell3 (Cell 4) on the SCC3 and SCell4 (Cell 5) on the SCC4 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.94.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.94.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.94.4.3.
6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.
7. The SS activates SCell2 in subframe (m+10) for FDD PCell and (m+15) for TDD PCell, SCell 3 in subframe (m+20) for FDD PCell and (m+15) for TDD PCell and SCell 4 in subframe (m+30) for FDD PCell and (m+15) for TDD PCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).
8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells.

   8a. For all intra-band PCell FDD case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+49),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC(FDD) and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+49),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+15) to (m+23), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+25) to (m+33) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+35) to (m+43) up to the end of T2,

- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

8c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+10) if the subframe (m+8) was subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+49),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23), the subframes (m+25) to (m+33) and the subframes (m+35) to (m+43) up to the end of T2,
- and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+35) to (m+43) up to the end of T2,
- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

8d. For all intra-band PCell TDD case

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+49),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49).
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

8e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to (m+49),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49),
- and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,

- or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
- or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
- or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
- or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

8f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframes (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+49),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+49),
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is an even number for FDD PCell and 4 or 9 for TDD PCell. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 in subframe (n+10) for FDD PCell and (n+15) for TDD PCell, SCell 3 in subframe (n+20) for FDD PCell and (n+30) for TDD PCell and SCell 4 in subframe (n+30) for FDD PCell and (n+45) for TDD PCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

11a. For all intra-band PCell FDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and (n+35) to (n+43) up to the end of T3
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11b. For the case where the band relation between PCC(FDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and the subframes (n+35) to (n+43) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+15) to (n+23), ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+25) to (n+33) and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+35) to (n+43) up to the end of T3
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11c. For the case where the band relation between PCC(FDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23), the subframes (n+25) to (n+33) and the subframes (n+35) to (n+43) and up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+25) to (n+33) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+35) to (n+43), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11d. For all intra-band PCell TDD case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+9) and (n+13), the subframes (n+20) to (n+24) and (n+28), the subframes (n+35) to (n+39) and (n+43) and the subframes (n+50) to (n+54) and (n+58) up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+6) to (n+10) and (n+13) to (n+14), the subframes (n+21) to (n+25) and (n+28) to (n+29) , the subframes (n+36) to (n+40) and (n+43) and subframes (n+51) to (n+55) and (n+58) up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18), the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33) , the subframes (n+37) to (n+41) and (n+43) and subframes (n+52) to (n+56) and (n+58) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11e. For the case where the band relation between PCC(TDD) and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
  - and DTX is not observed by the SS anywhere outside the subframes (n+5), (n+9), (n+20), (n+24), (n+35), (n+39), (n+50) and (n+54) up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+6), (n+13), (n+21), (n+28), (n+36), (n+43), (n+51) and (n+58), up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+7), (n+13), (n+22), (n+28), (n+37), (n+43), (n+52) and (n+58), up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+8) and (n+23), up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+9) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+10), (n+14), (n+25), (n+29), (n+40), (n+44) and (n+55), up to the end of T3,

- or DTX is not observed by the SS anywhere outside the subframes (n+11), (n+18), (n+26), (n+33), (n+41), (n+48), (n+56) and (n+58), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11f. For the case where the band relation between PCC(TDD) and SCell1 is intra-band and the others SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+9) and (n+13),
  - or DTX is not observed by the SS anywhere outside the subframes (n+6) to (n+10) and (n+13) to (n+14)
  - or DTX is not observed by the SS anywhere outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
- and DTX is not observed by the SS anywhere outside the subframes (n+20) and (n+24), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+21) and (n+28), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+22) and (n+28), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+23), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+24), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+25) and (n+29), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+26) and (n+33), up to end of T3,
- and DTX is not observed by the SS anywhere outside the subframes (n+35) and (n+39), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+36) and (n+43), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+37) and (n+43), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+38), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+39), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+40) and (n+44), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+41) and (n+48), up to end of T3,
- and DTX is not observed by the SS anywhere outside the subframes (n+50) and (n+54), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+51) and (n+58), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+52) and (n+58), up to end of T3,
  - or DTX is not observed by the SS anywhere outside the subframes (n+53), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+54), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+55), up to end of T2,
  - or DTX is not observed by the SS anywhere outside the subframes (n+56), up to end of T2,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.94.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.94.4.3-1: Common Exception messages for 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.94.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.94.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		FDD
	159		TDD
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.94.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.94.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path:TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.94.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in FDD
	483	(see Table 7.2.2-1B in TS 36.213)	Cell2 and PCell is in TDD
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.94.4.3-7: *QuantityConfig-DEFAULT:* Additional 5DL CA Activation and Deactivation of Unknown SCell in non-DRX with generic duplex modes

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.94.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4, Cell 5
}			

Table 8.16.94.4.3-9: *SystemInformationBlockType2:* Additional 5DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1 in FDD and Cell2 is in FDD
}			

8.16.94.5 Test Requirements

Table 8.16.94.5-1 and 8.16.94.5-2 define the Cell specific test parameters for unknown SCell1 activation.

Table 8.16.94.5-1: Cell specific test parameters for unknown SCell1 activation

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1	2		3
Duplex mode		FDD or TDD	FDD or TDD		FDD or TDD
TDD Special subframe configuration		6	6		6
TDD Uplink-downlink configuration		1	1		1
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-		-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA	dB	0	0		0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-104	-104		-104
$\hat{E}_s/N_{oc}$	dB	17	-infinity	17	17
$\hat{E}_s/I_{ot}$	dB	17	-infinity	17	17
RSRP Note 3	dBm/15 kHz	-87	-infinity	-87	-87
SCH_RP Note 3	dBm/15 kHz	-87	-infinity	-87	-87
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN		AWGN
Antenna Configuration		1x2	1x2		1x2
Timing offset to Cell 1	µs	-	0		0
Time alignment error relative to cell 1 Note 5	µs	-	≤ TAE		≤ TAE
Time alignment error relative to cell 2 Note 5	µs	-	-		≤ TAE
Time alignment error relative to cell 3 Note 5	µs	-	-		-
Time alignment error relative to cell 4 Note 5	µs	-	-		-

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.94.5-2: Cell specific test parameters for unknown SCell1 activation

Parameter	Unit	Cell 4			Cell 5					
		T1	T2	T3	T1	T2	T3			

E-UTRA RF Channel Number		4	5	
Duplex mode		FDD or TDD	FDD or TDD	
TDD Special subframe configuration		6	6	
TDD Uplink-downlink configuration		1	1	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		-	-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	0	0	
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-104	-104	
$\hat{E}_s/N_{oc}$	dB	17	17	
$\hat{E}_s/I_{ot}$	dB	17	17	
RSRP Note 3	dBm/15 kHz	-87	-87	
SCH_RP Note 3	dBm/15 kHz	-87	-87	
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	
Propagation Condition		AWGN	AWGN	
Antenna Configuration		1x2	1x2	
Timing offset to Cell 1	µs	0	0	
Time alignment error relative to cell 1 Note 5	µs	≤ TAE	≤ TAE	
Time alignment error relative to cell 2 Note 5	µs	≤ TAE	≤ TAE	
Time alignment error relative to cell 3 Note 5	µs	≤ TAE	≤ TAE	
Time alignment error relative to cell 4 Note 5	µs	-	≤ TAE	

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) for FDD PCell and (m+9) for TDD PCell, if the subframe (m+8) was subject to interruption, or in subframe (m+13) for TDD PCell, if the subframes (m+8) and (m+9) were subject to interruption. Whether CSI report in subframe (m+8) / (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) / (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+49).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9), (m+15) to (m+19), (m+25) to (m+29) and (m+35) to (m+39) for FDD PCell, and not outside subframes (m+5) to (m+11) and (m+20) to (m+26) for TDD PCell.

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9), (n+15) to (n+19), (n+25) to (n+29) and (n+35) to (n+39) for FDD PCell, and not outside subframes (n+5) to (n+11), (n+20) to (n+26), (n+35) to (n+41) and (n+50) to (n+56) for TDD PCell.

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+49) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI

8.16.95 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

8.16.95.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.95.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 14 and forward that support 6DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 14 and forward that support 6DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 14 and forward that support E-UTRA FDD, TDD and 6DL CA. Applicability requires support for FGI bit 111.

8.16.95.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.95.

8.16.95.4 Test description

8.16.95.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [TBD] and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from table 8.16.95.5-1, table 8.16.95.5-2 and table 8.16.95.5-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to table 8.16.95.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.95.4.3.
5. Cell 1 is the PCell on the PCC channel 1, Cell 2 is a SCell on the SCC channel 2, Cell 3 is a SCell on the SCC channel 3, Cell 4 is a SCell on the SCC channel 4, Cell 5 is a SCell on the SCC channel 5, Cell 6 is a SCell on the SCC channel 6 and Cell 7 is a neighbour cell on the SCC channel 6. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 shall be powered OFF.

Table 8.16.95.4.1-1: General test parameters for E-UTRAN 6DL CA event triggered reporting under fading propagation conditions with 5 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4, 5, 6	Six radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell			Cell 5	Configured deactivated secondary cell on RF channel number 5.
Configured deactivated SCell			Cell 6	Configured deactivated secondary cell on RF channel number 6.
Neighbour cell			Cell 7	Neighbour cell to be identified on RF channel number 6.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
TDD special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5, cell6 and cell 7).
TDD uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5, cell6 and cell 7).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	

Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 5	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 6	dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	For cell2, cell3, cell4, cell5 and cell6
T1	s	5	During this time the cell1, cell3, cell4, cell5 and cell6 shall be known to the UE; but cell2 and cell7 shall be unknown to the UE.
T2	s	≤12	UE should report Event A1 for cell2 and event A6 for cell7 within 6.4s (20×scellMeasCycle)
T3	s	5	UE should report Event A2 within 200 ms for cell1 and within 1.6s for each of cells 2, 3, 4, 5 and 6.

8.16.95.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on Cell 7. At the beginning of T2 the transmission power of Cell 7 is increased to the same level as for Cell 6, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of Cell 2 is increased to the same level as for Cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of Cells 1, 2, 3, 4, 5, 6 and 7 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2, for Cell 3, for Cell 4, for Cell 5 and for Cell 6. Cells 1, 2, 3, 4, 5, 6 and 7 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.95.4.3.
4. Set the parameters according to T1 in table 8.16.95.5-1, table 8.16.95.5-2 and table 8.16.95.5-3. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in table 8.16.95.5-1, table 8.16.95.5-2 and table 8.16.95.5-3.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
9. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in table 8.16.95.5-1, table 8.16.95.5-2 and table 8.16.95.5-3.
11. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6, respectively.

12. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

13. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

14. If the measurement reporting delay for Cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.

15. If the measurement reporting delay for Cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 4 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 4 A2 is increased by one.

16. If the measurement reporting delay for Cell 5 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 5 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 5 A2 is increased by one.

17. If the measurement reporting delay for Cell 6 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 6 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 6 A2 is increased by one.

18. After the SS receives the MeasurementReport message in steps 12, 13, 14, 15, 16 and 17 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

19. Set Cell 2 physical cell identity = ((current Cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

20. Set Cell 7 physical cell identity = ((current Cell 6 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 7 = physical cell identity of Cell 6 then skip this physical cell identity value for Cell 7.

21. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

22. Repeat step 3-21 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2”, “Cell 3 A2”, “Cell 4 A2”, “Cell 5 A2” and “Cell 6 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.95.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.95.4.3-1: Common Exception messages for 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.95.4.3-2: *MeasConfig-DEFAULT*: Additional 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	6 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
MeasObjectToAddMod[5] SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the SCell on the SCC (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f5)		
MeasObjectToAddMod[6] SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the SCell on the SCC (Cell 6) and neighbouring cell on the SCC (Cell 7)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f6)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			

measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	7 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A2		
measId	6		
measObjectId	IdMeasObject-f5		
reportConfigId	idReportConfig-A2		
measId	7		
measObjectId	IdMeasObject-f6		
reportConfigId	idReportConfig-A2		
measId	8		
measObjectId	IdMeasObject-f6		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.95.4.3-3: MeasObjectEUTRA-GENERIC: Additional 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4, Cell 5, Cell 6
}			

Table 8.16.95.4.3-4: *ReportConfig-A1*: Additional 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.95.4.3-5: *ReportConfig-A2*: Additional 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.95.4.3-6: *MeasurementReport*: Additional 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		event “A1”
	2		event “Cell 1 A2”
	3		event “Cell 2 A2”
	4		event “Cell 3 A2”
	5		event “Cell 4 A2”
	6		event “Cell 5 A2”
	7		event “Cell 6 A2”
	8		event “A6”
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE { }	Not present		
measResultNeighCells CHOICE {			event “A6”
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	The same number of entries as the configured SCell(s)	*n* denotes the index of the entry	
MeasResultServFreq-r10[n] {			
servFreqId-r10	Set according to the configured SCell(s)		
measResultSCell-r10 SEQUENCE {		SCell(s)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

8.16.95.5 Test requirement

Table 8.16.95.4.1-1,table 8.16.95.5-1, table 8.16.95.5-2 and table 8.16.95.5-3 defines the primary level settings including test tolerances for 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes tests.

Table 8.16.95.5-1: Cell specific test parameters for E-UTRAN 6DL CA event triggered reporting under fading propagation conditions with 5 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 KHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
$\hat{E}_s/I_{ot}$ Note 3	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	≤ TAE			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	≤ TAE			≤ TAE			-		
Time alignment error relative to cell 4 Note 5	µs	≤ TAE			≤ TAE			≤ TAE		

Time alignment error relative to cell 5[Note 5]	µs	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 6[Note 5]	µs	≤ TAE	≤ TAE	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.95.5-2: Cell specific test parameters for E-UTRAN 6DL CA event triggered reporting under fading propagation conditions with 5 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 4			Cell 5			Cell 6		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		4			5			6		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 KHz	-104			-104			-104.5		
$\hat{E}_s/N_{oc}$	dB	17.2	17.2	-3.2	17.2	17.2	-3.2	17.7	17.7	-3.7
$\hat{E}_s/I_{ot}$ [Note 3]	dB	17.2	17.2	-3.2	17.2	17.2	-3.2	17.7	0.61	-5.24
RSRP [Note 3]	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2	-86.8	-86.8	-108.2
SCH_RP [Note 3]	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2	-86.8	-86.8	-108.2
Io [Note 3]	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.95 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.04 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			0			0		
Time alignment error relative to cell1[Note 5]	µs	-			-			-		
Time alignment error relative to cell2[Note 5]	µs	-			-			-		
Time alignment error relative to cell3[Note 5]	µs	-			-			-		
Time alignment error relative to cell4[Note 5]	µs	-			-			-		
Time alignment error relative to cell5[Note 5]	µs	-			-			-		
Time alignment error relative to cell6[Note 5]	µs	-			-			-		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.95.5-3: Cell specific test parameters for E-UTRAN 6DL CA event triggered reporting under fading propagation conditions with 5 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 7		
		T1	T2	T3

E-UTRA RF Channel Number		6		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 KHz	-104.5		
$\hat{E}_s/N_{oc}$	dB	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$ Note 3	dB	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	Specified in columns for Cell 6		
Propagation Condition		ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low		
Timing offset to Cell 1	µs	3		
Time alignment error relative to cell1 Note 5	µs	NA		
Time alignment error relative to cell2 Note 5	µs	NA		
Time alignment error relative to cell3 Note 5	µs	NA		
Time alignment error relative to cell4 Note 5	µs	NA		
Time alignment error relative to cell5 Note 5	µs	NA		
Time alignment error relative to cell6 Note 5	µs	NA		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for Cell 2, Cell 3, Cell 4 and Cell 5 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$
- where $T_{measure\_scc}$ = 5 *measCycleSCell.*

The UE shall send one Event A2 triggered measurement report for Cell 2, one Event A2 triggered measurement report for Cell 3, and one Event A2 triggered measurement report for cell with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2, Cell 4 Event A2, Cell 5 Event A2 and Cell 6 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.16.96 to 8.16.98

8.16.99 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

8.16.99.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.99.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 14 and forward that support 7DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA TDD UE release 14 and forward that support 7DL CA. Applicability requires support for FGI bit 111.

This test case also applies to all types of E-UTRA UE release 14 and forward that support E-UTRA FDD, TDD and 7DL CA. Applicability requires support for FGI bit 111.

8.16.99.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.99.

8.16.99.4 Test description

8.16.99.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [TBD] and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from table 8.16.99.5-1, table 8.16.99.5-2 and table 8.16.99.5-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to table 8.16.99.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.99.4.3.
5. Cell 1 is the PCell on the PCC channel 1, Cell 2 is a SCell on the SCC channel 2, Cell 3 is a SCell on the SCC channel 3, Cell 4 is a SCell on the SCC channel 4, Cell 5 is a SCell on the SCC channel 5, Cell 6 is a SCell on the SCC channel 6, Cell 7 is a SCell on the SCC channel 7 and Cell 8 is a neighbour cell on the SCC channel 7. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7 and Cell 8 shall be powered OFF.

Table 8.16.99.4.1-1: General test parameters for E-UTRAN 7DL CA event triggered reporting under fading propagation conditions with 6 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4, 5, 6, 7	Seven radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Configured deactivated SCell			Cell 5	Configured deactivated secondary cell on RF channel number 5.
Configured deactivated SCell			Cell 6	Configured deactivated secondary cell on RF channel number 6.
Configured deactivated SCell			Cell 7	Configured deactivated secondary cell on RF channel number 7.
Neighbour cell			Cell 8	Neighbour cell to be identified on RF channel number 7.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
TDD special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5, cell6, cell 7 and cell 8).
TDD uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration applies to all TDD cells (cell2, cell3, cell4, cell5, cell6, cell 7 and cell 8).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	

Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 5	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 6	dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 7	dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	For cell2, cell3, cell4, cell5, cell6 and cell7
T1	s	5	During this time the cell1, cell3, cell4, cell5, cell6 and cell7 shall be known to the UE; but cell2 and cell8 shall be unknown to the UE.
T2	s	≤12	UE should report Event A1 for cell2 and event A6 for cell8 within 6.4s (20×scellMeasCycle)
T3	s	5	UE should report Event A2 within 200 ms for cell1 and within 1.6s for each of cells 2, 3, 4, 5, 6, and 7

8.16.99.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on Cell 8. At the beginning of T2 the transmission power of Cell 8 is increased to the same level as for Cell 7, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of Cell 2 is increased to the same level as for Cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of Cells 1, 2, 3, 4, 5, 6, 7 and 8 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2, for Cell 3, for Cell 4, for Cell 5, for Cell 6 and for Cell 7. Cells 1, 2, 3, 4, 5, 6, 7 and 8 may operate in either FDD or TDD duplex mode according to test configuration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.99.4.3.
4. Set the parameters according to T1 in table 8.16.99.5-1, table 8.16.99.5-2 and table 8.16.99.5-3. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in table 8.16.99.5-1, table 8.16.99.5-2 and table 8.16.99.5-3.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
9. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in table 8.16.99.5-1, table 8.16.99.5-2 and table 8.16.99.5-3.
11. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7, respectively.

12. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

13. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

14. If the measurement reporting delay for Cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.

15. If the measurement reporting delay for Cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 4 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 4 A2 is increased by one.

16. If the measurement reporting delay for Cell 5 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 5 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 5 A2 is increased by one.

17. If the measurement reporting delay for Cell 6 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 6 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 6 A2 is increased by one.

18. If the measurement reporting delay for Cell 7 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 7 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 7 A2 is increased by one.

19. After the SS receives the MeasurementReport message in steps 12, 13, 14, 15, 16, 17 and 18 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

20. Set Cell 2 physical cell identity = ((current Cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

21. Set Cell 8 physical cell identity = ((current Cell 7 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 8 = physical cell identity of Cell 7 then skip this physical cell identity value for Cell 8.

22. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

23. Repeat step 3-22 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2”, “Cell 3 A2”, “Cell 4 A2”, “Cell 5 A2”, “Cell 6 A2” and “Cell 7 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.99.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.99.4.3-1: Common Exception messages for 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.99.4.3-2: *MeasConfig-DEFAULT*: Additional 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	7 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
MeasObjectToAddMod[5] SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the SCell on the SCC (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f5)		
MeasObjectToAddMod[6] SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the SCell on the SCC (Cell 6)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f6)		
MeasObjectToAddMod[7] SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the SCell on the SCC (Cell 7) and neighbouring cell on the SCC (Cell 8)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f7)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		

reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	8 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A2		
measId	6		
measObjectId	IdMeasObject-f5		
reportConfigId	idReportConfig-A2		
measId	7		
measObjectId	IdMeasObject-f6		
reportConfigId	idReportConfig-A2		
measId	8		
measObjectId	IdMeasObject-f7		
reportConfigId	idReportConfig-A2		
measId	9		
measObjectId	IdMeasObject-f7		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.99.4.3-3: MeasObjectEUTRA-GENERIC: Additional 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7
}			

Table 8.16.99.4.3-4: *ReportConfig-A1*: Additional 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.99.4.3-5: *ReportConfig-A2*: Additional 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.99.4.3-6: *MeasurementReport*: Additional 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		event “A1”
	2		event “Cell 1 A2”
	3		event “Cell 2 A2”
	4		event “Cell 3 A2”
	5		event “Cell 4 A2”
	6		event “Cell 5 A2”
	7		event “Cell 6 A2”
	8		event “Cell 7 A2”
	9		event “A6”
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE { }	Not present		
measResultNeighCells CHOICE {			event “A6”
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	The same number of entries as the configured SCell(s)	*n* denotes the index of the entry	
MeasResultServFreq-r10[n] {			
servFreqId-r10	Set according to the configured SCell(s)		
measResultSCell-r10 SEQUENCE {		SCell(s)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

8.16.99.5 Test requirement

Table 8.16.99.4.1-1,table 8.16.99.5-1, table 8.16.99.5-2 and table 8.16.99.5-3 defines the primary level settings including test tolerances for 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes tests.

Table 8.16.99.5-1: Cell specific test parameters for E-UTRAN 7DL CA event triggered reporting under fading propagation conditions with 6 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 1			Cell 2			Cell3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 KHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
$\hat{E}_s/I_{ot}$ Note 3	dB	17	17	-3	-infinity	17.2	-3.2	17.2	17.2	-3.2
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-107.2
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	≤ TAE			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	≤ TAE			≤ TAE			-		
Time alignment error relative to cell 4 Note 5	µs	≤ TAE			≤ TAE			≤ TAE		
Time alignment error relative to cell 5 Note 5	µs	≤ TAE			≤ TAE			≤ TAE		
Time alignment error relative to cell 6 Note 5	µs	≤ TAE			≤ TAE			≤ TAE		

Time alignment error relative to cell 7[Note 5]	µs	≤ TAE	≤ TAE	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.99.5-2: Cell specific test parameters for E-UTRAN 7DL CA event triggered reporting under fading propagation conditions with 6 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 4			Cell 5			Cell 6		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		4			5			6		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 KHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17.2	17.2	-3.2	17.2	17.2	-3.2	17.2	17.2	-3.2
$\hat{E}_s/I_{ot}$ Note 3	dB	17.2	17.2	-3.2	17.2	17.2	-3.2	17.2	17.2	-3.2
RSRP Note 3	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2
SCH_RP Note 3	dBm/15 kHz	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2	-86.8	-86.8	-107.2
Io Note 3	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			0			0		
Time alignment error relative to cell1 Note 5	µs	-			-			-		
Time alignment error relative to cell2 Note 5	µs	-			-			-		
Time alignment error relative to cell3 Note 5	µs	-			-			-		
Time alignment error relative to cell4 Note 5	µs	-			-			-		
Time alignment error relative to cell5 Note 5	µs	-			-			-		
Time alignment error relative to cell6 Note 5	µs	-			-			-		
Time alignment error relative to cell7 Note 5	µs	-			-			-		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.99.5-3: Cell specific test parameters for E-UTRAN 7DL CA event triggered reporting under fading propagation conditions with 6 configured but deactivated SCells in non-DRX with generic duplex modes

Parameter	Unit	Cell 7			Cell 8		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		7					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel defined in Annex A.1		-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel defined in Annex A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined in Annex D		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104.5			-104.5		
$\hat{E}_s/N_{oc}$	dB	17.7	17.7	-3.7	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$ Note 3	dB	17.7	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.95 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.04 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 7		
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			3		
Time alignment error relative to cell1 Note 5	µs	-			NA		
Time alignment error relative to cell2 Note 5	µs	-			NA		
Time alignment error relative to cell3 Note 5	µs	-			NA		
Time alignment error relative to cell4 Note 5	µs	-			NA		
Time alignment error relative to cell5 Note 5	µs	-			NA		
Time alignment error relative to cell6 Note 5	µs	-			NA		
Time alignment error relative to cell7 Note 5	µs	-			NA		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$
- where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2, one Event A2 triggered measurement report for Cell 3, and one Event A2 triggered measurement report for cell with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2, Cell 4 Event A2, Cell 5 Event A2, Cell 6 Event A2 and Cell 7 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.17 RSTD Measurements for E-UTRAN Carrier Aggregation

The RSTD measurements for EUTRAN Carrier Aggregation test cases can be found in TS 37.571-1 [27].

8.18 E-UTRAN TDD – HRPD Measurements

8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.18.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - HRPD cell search requirements.

8.18.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD. Applicability requires support for FGI bit 15.

8.18.1.3 Minimum requirement

UE shall perform HRPD measurements according to the procedure defined in 3GPP2 C.S0024-B on the HRPD neighbour cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform HRPD measurements only during the measurement gaps configured by the serving eNode B.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.12 and A.8.18.1.

8.18.1.4 Test description

8.18.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.
2. The general test parameter settings are set up according to Table 8.18.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.18.1.4.3.

5. There is one E-UTRA TDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.18.1.4.1-1: General test parameters for E-UTRAN TDD to HRPD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRAN TDD cell
Neighbouring cell		Cell 2	HRPD cell
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
Inter-RAT (HRPD) measurement quantity		CDMA2000 HRPD Pilot Strength	
b1-ThresholdCDMA2000	dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B1
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	Non-DRX test
Access Barring Information	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number		1	One HRPD carrier frequency is used.
HRPD neighbour cell list size		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	s	5	
T2	s	3	

8.18.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.18.1.5-1 and 8.18.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.19.1.5-1 and 8.19.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 2136 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different PN Offset on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.18.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.18.1.4.3-1: Common Exception messages for E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.18.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f14	f14 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f14		
reportConfigId	IdReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.18.1.4.3-3: *ReportConfigInterRAT-B1-CDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-CDMA2000(CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdCDMA2000 CHOICE {			
ThresholdCDMA2000	14(-7)	-2*10*log10(Ec/Io) in units of 0.5dB, see C.S0005-A for details	
}			
}			
}			
}			
hysteresis	0		
}			
}			
}			

Table 8.18.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
MeasResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 8.18.1.4.3-5: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000::= SEQUENCE {			
preRegistrationStatusHRPD	true		
measResultListCDMA2000	MeasResultListCDMA2000		
}			

Table 8.18.1.4.3-6: *MeasResultListCDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListCDMA2000::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellIdCDMA2000		
measResult SEQUENCE {			
pilotStrength	6(-3)	-2*10*log10(Ec/Io) in units of 0.5dB, see C.S0005-A for details	
}			
}			

8.18.1.5 Test requirement

Tables 8.18.1.4.1-1, 8.18.1.5-1 and 8.18.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions test.

Table 8.18.1.5-1: Cell specific test parameters for E-UTRAN TDD cell#1 for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 1 (E-UTRA)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-98 +TT	-98+TT
$\hat{E}_s / N_{oc}$	dB	0	0
$\hat{E}_s / I_{ot}$	dB	0+TT	0+TT
Propagation Condition		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.18.1.5-2: Cell specific test parameters for HRPD (cell # 2) for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3+TT
Propagation Condition		ETU70	

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{measurement\_HRPD} = T_{measurement\_CDMA2000\_1x}$

$$T_{measurement\_CDMA2000\_1x} = T_{basic\_measurement\_CDMA2000\_1x} \cdot N_{Freq} \cdot S_{gap}$$

$T_{basic\_identify\_UTRA\_TDD}$ = 100 ms

N_{Freq} = 1

S_{gap} = 64/3

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2136 ms in this test case (note: this gives a total of 2134 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.19 E-UTRAN TDD – CDMA2000 1X Measurements

8.19.1 E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.19.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD-CDMA2000 1X inter-frequency cell search requirements.

8.19.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bit 15.

8.19.1.3 Minimum conformance requirements

When measurement gaps are scheduled for CDMA2000 1xRTT inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CDMA2000 1xRTT Pilot Strength measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] Section 9.5, corresponding to a 90% measurement success rate, with measurement period given by

$$T_{measurement\_CDMA2000\_1x} = T_{basic\_measurement\_CDMA2000\_1x} \cdot N_{Freq} \cdot S_{gap}$$

where $T_{basic\_measurement\_CDMA2000\_1x}$ = 100 ms and the measurement gap specific scale factor S_{gap} is based on the measurement gap pattern in use as defined in Table 8.19.1.3-1. If inter-frequency RSTD measurements are configured as a part of the measurement configuration, S_{gap} shall be based to the Gap Pattern Id 1.

Table 8.19.1.3-1: Gap Pattern Specific Scale Factor

Gap Pattern Id	S_{gap}
0	32/3
1	64/3

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The measurement reporting delay of each periodic report is defined as the time between the end of the last measurement period and the moment when the UE starts to transmit the measurement report over the Uu interface. This delay shall be less than T_{71m} defined in 3GPP2 C.S0005-D for each periodic report. This measurement reporting delay excludes a delay which is caused by the unavailability of the uplink resources for the UE to send the measurement report.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.10 and A.8.19.1.

8.19.1.4 Test description

8.19.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 8.19.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.19.1.4.3.

5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.19.1.4.1-1: General test parameters for E-UTRAN TDD-CDMA2000 1X event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on CDMA2000 1X RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CDMA2000 1X Channel Number		1	One CDMA2000 1X carrier frequency is used.
Inter-RAT (CDMA2000 1X) measurement quantity		CDMA2000 1xRTT Pilot Strength	
B1-Threshold-CDMA2000	dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
cdma2000 1X neighbour cell list size		8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	s	5	
T2	s	3	

8.19.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 8.19.1.5-1 and 8.19.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.19.1.5-1 and 8.19.1.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 2136 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different PN Offset on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.19.1.4.3-1: Common Exception messages for E-UTRAN TDD – CDMA 2000 1X event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.18.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f17	f17 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f17		
reportConfigId	IdReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.19.1.4.3-3: *ReportConfigInterRAT-B1-CDMA2000*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-CDMA2000 (CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-Threshold CDMA2000	28(-14)	INTEGER (0..63)	CDMA2000
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.19.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 8.19.1.4.3-5: MeasResultsCDMA2000: Additional E-UTRAN TDD – CDMA 2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000::= SEQUENCE (			
preRegistrationStatusHRPD	FALSE		
measResultListCDMA2000	MeasResultListCDMA2000		
}			

Table 8.19.1.4.3-6: MeasResultListCDMA2000: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListCDMA2000::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCDMA2000 {			
MeasResultCDMA2000 ::= SEQUENCE {			
physCellId	PhysCellIdCDMA2000		
measResult ::= SEQUENCE {			
pilotStrength	20 (-10)	INTEGER (0..63)	
}			
}			
}			

8.19.1.5 Test requirement

Tables 8.19.1.4.1-1, 8.19.1.5-1 and 8.19.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions.

Table 8.19.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s / I_{ot}$	dB	4+TT	4+TT
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.19.1.5-2: Cell specific test parameters for CDMA2000 1X (cell # 2) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell 2 (cdma2000 1X)	
		T1	T2
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12	
$\hat{I}_{or} / I_{oc}$	dB	-infinity	0
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10+TT
Propagation Condition		ETU70	

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE sends one Event B1 triggered measurement report including PN offset of Cell 2.

The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{measurement\_CDMA2000\_1x}$

$$T_{measurement\_CDMA2000\_1x} = T_{basic\_measurement\_CDMA2000\_1x} \cdot N_{Freq} \cdot S_{gap}$$

$T_{basic\_measurement\_CDMA2000\_1x}$ = 100 ms.

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

S_{gap}=64/3. It is based on the measurement gap pattern in use as defined in Table 8.19.1.3-1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2136 ms in this test case (note: this gives a total of 2134 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20 Inter-frequency/RAT Measurements in CA mode

8.20.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.20.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements in CA mode. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.20.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,

- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.20.1.3-1.

Table 8.20.1.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.20.1.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.20.1.

8.20.1.4 Test description

8.20.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.43 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.20.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.1.4.3.

5. There are three E-UTRA FDD carriers and three cells specified in the test. Cell 1 is the PCell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 is the inter-frequency neighbour cell, Cell 3 is the SCell. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.1.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One FDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Cell2 timing offset to cell1	ms	3	Asynchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	5	

8.20.1.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3 The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.1.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.20.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.20.1.5-1.

9. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5

Table 8.20.1.4.3-2: *MeasConfig:* Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.20.1.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.20.1.5 Test requirement

Tables 8.20.1.4.1-1 and 8.20.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.20.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD		OP.1 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	90.3	-94	-94
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.7	4	4
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.20.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements in CA mode. This test will partly verify the TDD-TDD inter-frequency cell search requirements.

8.20.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,

- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.20.2.3-1.

Table 8.20.2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.20.2.

8.20.2.4 Test description

8.20.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.43 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.20.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.2.4.3.

5. There are three E-UTRA TDD carriers and three cells specified in the test. Cell 1 is the PCell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 is the inter-frequency neighbour cell, Cell 3 is the SCell. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	µs	3	Synchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	

8.20.2.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3 The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.2.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.20.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.20.2.5-1.

9. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5

Table 8.20.2.4.3-2: *MeasConfig:* Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
}			

Table 8.20.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.20.2.5 Test requirement

Tables 8.20.2.4.1-1 and 8.20.2.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	**Unit**	**Cell 1**		**Cell 2**		**Cell 3**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		**1x2 Low**		**1x2 Low**		**1x2 Low**	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD		OP.1 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2A E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth

8.20.2A.1 Test purpose

Same test purpose as in clause 8.20.2.1.

8.20.2A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2A.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.2.3.

8.20.2A.4 Test description

8.20.2A.4.1 Initial conditions

Same initial conditions as in clause 8.20.2.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz.
  - Instead of Table 8.20.2.4.1-1 → use Table 8.20.2A.4.1-1.

Table 8.20.2A.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions for 20 MHz +20 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in clause A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	20	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	μs	3	Synchronous cells
Cell3 timing offset to cell1	μs	0	Synchronous cells
Time alignment error between cell3 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3			

8.20.2A.4.2 Test procedure

Same test procedure as in clause 8.20.2.4.2 with the following exceptions:

- Instead of Table 8.20.2.5-1 → use Table 8.20.2A.5-1.

8.20.2A.4.3 Message contents

Same message contents as in clause 8.20.2.4.3.

8.20.2A.5 Test requirement

Tables 8.20.2A.4.1-1 and 8.20.2A.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2A.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz + 20 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	20		20		20	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8)		OP.7 TDD		OP.8 TDD		OP.7 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms.

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2B E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

8.20.2B.1 Test purpose

Same test purpose as in clause 8.20.2.1.

8.20.2B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2B.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.2.3.

8.20.2B.4 Test description

8.20.2B.4.1 Initial conditions

Same initial conditions as in clause 8.20.2.4.1 with the following exceptions:

- Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.
- Channel Bandwidth to be tested:The bandwidth combination supported by UE from Table 8.20.2B.5-1 and Annex E table E-3 as defined in 3GPP TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in 3GPP TS 36.521-1 [10] clause 5.4.2A.

- Instead of Table 8.20.2.4.1-1 → use Table 8.20.2B.4.1-1.

Table 8.20.2B.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions for 20 MHz +10 MHz bandwidth

Parameter	Unit	Value	Comment
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	20	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	μs	3	Synchronous cells
Cell3 timing offset to cell1	μs	0	Synchronous cells
Time alignment error between cell3 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.			

8.20.2B.4.2 Test procedure

Same test procedure as in clause 8.20.2.4.2 with the following exceptions:

- Instead of Table 8.20.2.5-1 → use Table 8.20.2B.5-1.

8.20.2B.4.3 Message contents

Same message contents as in clause 8.20.2.4.3.

8.20.2B.5 Test requirement

Tables 8.20.2B.4.1-1 and 8.20.2B.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2B.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	20		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1) and in D.2.2 (OP.2 TDD) and in D.2.7 (OP.7)		OP.7 TDD		OP.2 TDD		OP.1 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.20.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements in CA mode.

8.20.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA FDD. Applicability requires support for FGI bit 15.

This test applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA FDD. Applicability requires support for FGI bit 15.

8.20.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,

- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurement\ UTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.20.3.

8.20.3.4 Test description

8.20.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.44 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86, without fading for the WCDMA cell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.20.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.3.4.3.

5. There is one E-UTRA FDD Cell 1 for PCC, one E-UTRA FDD Cell 3 for SCC and one UTRA FDD Cell 2 specified in the test. Cell 1 (E-UTRA FDD cell for PCC) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.3.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Configured active SCell		Cell 3	Cell 3 is on E-UTRA RF channel number 2.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.20.3.4.2 Test procedure

The test consists of one active E-UTRA Cell 1 and one UTRA neighbour cell 2 and one configured active SCell Cell 3. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.3.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).

5. Set the parameters according to T1 in Table's 8.20.3.5-1 and 8.20.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. SS shall transmit an RRCConnectionReconfiguration message with Event B1 configured.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.20.3.5-1 and 8.20.3.5-2.

9. The UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.20.3.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
measObjectId[2]	IdMeasObject-f2	f2 is the frequency of the configured SCell (E-UTRA Cell)	
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	E-UTRA Cell	
measObjectId[3]	IdMeasObject-f10	f10 is the frequency of the neighbouring cell(UTRA Cell)	
measObject[3]	MeasObjectUTRA-GENERIC(f10)	UTRA Cell	
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f10		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.20.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.20.3.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			

Table 8.20.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.20.3.5 Test requirement

Tables 8.20.3.4.1-1, 8.20.3.5-1 and 8.20.3.5-2 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test in CA mode.

Table 8.20.3.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1, cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		**1x2 Low**		**1x2 Low**	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s / I_{ot}$	dB	4	4	4	4
$\hat{E}_s / N_{oc}$	dB	4	4	4	4
N_{oc}	dBm/15 kHz	-98		-98	
RSRP	dBm/15 kHz	-94	-94	-94	-94
SCH_RP	dBm/15 kHz	-94	-94	-94	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.20.3.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop.			
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions

8.20.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA TDD cell search requirements in CA mode.

8.20.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD.}$

$X_{basic\ measurementUTRA\_TDD}$ = 6

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.20.4.

8.20.4.4 Test description

8.20.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.44 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.86, without fading for the TD-SCDMA cell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. The general test parameter settings are set up according to Table 8.20.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.4.4.3.

5. There is one E-UTRA TDD Cell 1 for PCC, one E-UTRA TDD Cell 3 for SCC and one UTRA TDD Cell 2 specified in the test. Cell 1 (E-UTRA TDD cell for PCC) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.4.4.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	

8.20.4.4.2 Test procedure

This test scenario comprised of 1 E-UTRA TDD PCell, 1 E-UTRA TDD SCell and 1 UTRA TDD cell to be searched. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.4.4.3.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
5. Set the parameters according to T1 in Table's 8.20.4.5-1 and 8.20.4.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
6. SS shall transmit an RRCConnectionReconfiguration message with Event B1 configured.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.20.4.5-1 and 8.20.4.5-2.
9. The UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6402 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
10. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
11. SS shall change to set cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16.
12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.4.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.20.4.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
measObjectId[2]	IdMeasObject-f2	f2 is the frequency of the configured SCell (E-UTRA Cell)	
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	E-UTRA Cell	
measObjectId[3]	IdMeasObject-f9	f9 is the frequency of the neighbouring cell(UTRA Cell)	
measObject[3]	MeasObjectUTRA-GENERIC(f9)	UTRA Cell	
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f9		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.20.4.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	28	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.20.4.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			

Table 8.20.4.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.20.4.5 Test requirement

Tables 8.20.4.4.1-1, 8.20.4.5-1 and 8.20.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1, cell3)

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD		OP.1 TDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note1	dB				
OCNG_RB Note1	dB				
$\hat{E}_s / I_{ot}$	dB	9	9	9	9
$\hat{E}_s / N_{oc}$	dB	9	9	9	9
N_{oc}	dBm/15kHz	-98			
RSRP	dBm/15kHz	-89	-89	-89	-89
SCH_RP	dBm/15kHz	-89	-89	-89	-89
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.20.4.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5 +
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth

8.20.4A.1 Test purpose

Same test purpose as in clause 8.20.4.1.

8.20.4A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4A.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.4.3.

8.20.4A.4 Test description

8.20.4A.4.1 Initial conditions

Same initial conditions as in clause 8.20.4.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz
- Instead of Table 8.20.4.4.1-1 → use Table 8.20.4A.4.1-1.

Table 8.20.4A.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) cell search in fading propagation conditions for 20 MHz + 20 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3			

8.20.4A.4.2 Test procedure

Same test procedure as in clause 8.20.4.4.2 with the following exceptions:

- Instead of Table 8.20.4.5-1 → use Table 8.20.4A.5-1.
- Instead of Table 8.20.4.5-2 → use Table 8.20.4A.5-2.

8.20.4A.4.3 Message contents

Same message contents as in clause 8.20.4.4.3.

8.20.4A.5 Test requirement

Table 8.20.4A.4.1-1, 8.20.4A.5-1 and 8.20.4A.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4A.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case for 20 MHz + 20 MHz bandwidth (cell 1, cell3)

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	20		20	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.7 (OP.7 TDD)		OP.7 TDD		OP.7 TDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note1	dB				
OCNG_RB Note1	dB				
$\hat{E}_s / I_{ot}$	dB	9	9	9	9
$\hat{E}_s / N_{oc}$	dB	9	9	9	9
N_{oc}	dBm/15kHz	-98			
RSRP	dBm/15kHz	-89	-89	-89	-89
SCH_RP	dBm/15kHz	-89	-89	-89	-89
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.20.4A.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth

8.20.4B.1 Test purpose

Same test purpose as in clause 8.20.4.1

8.20.4B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4B.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.4.3

8.20.4B.4 Test description

8.20.4B.4.1 Initial conditions

Same initial conditions as in clause 8.20.4.4.1 with the following exceptions:

- Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.
- Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 8.20.4B.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.
- Instead of Table 8.20.4.4.1-1 → use Table 8.20.4B.4.1-1.

Table 8.20.4B.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) cell search in fading propagation conditions for 20 MHz + 10 MHz bandwidth

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.			

8.20.4B.4.2 Test procedure

Same test procedure as in clause 8.20.4.4.2 with the following exceptions:

- Instead of Table 8.20.4.5-1 → use Table 8.20.4B.5-1.

8.20.4B.4.3 Message contents

Same message contents as in clause 8.20.4.4.3.

8.20.4B.5 Test requirement

Table 8.20.4B.4.1-1, 8.20.4B.5-1 and 8.20.4B.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4B.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case for 20 MHz + 10 MHz bandwidth (cell 1, cell3)

Parameter	Unit	Combination	Cell 1		Cell 3	
			T1	T2	T1	T2
E-UTRA RF Channel Number		All	1		2	
$BW_{channel}$		20MHz+10MHz	20		10	
		10MHz+20MHz	10		20	
Correlation Matrix and Antenna Configuration		All	1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.1.2 (TDD)		20MHz+10MHz	R.3 TDD		R.0 TDD	
		10MHz+20MHz	R.0 TDD		R.3 TDD	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 (TDD)		20MHz+10MHz	R.10 TDD		R.6 TDD	
		10MHz+20MHz	R.6 TDD		R.10 TDD	
OCNG Pattern defined in D.2 (TDD)		20MHz+10MHz	OP.7 TDD		OP.1 TDD	
		10MHz+20MHz	OP.1 TDD		OP.7 TDD	
PBCH_RA	dB	All	0	0	0	0
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note1]	dB					
OCNG_RB[Note1]	dB					
$\hat{E}_s / I_{ot}$	dB	All	9	9	9	9
$\hat{E}_s / N_{oc}$	dB	All	9	9	9	9
N_{oc}	dBm/15kHz	All	-98			
RSRP	dBm/15kHz	All	-89	-89	-89	-89
SCH_RP	dBm/15kHz	All	-89	-89	-89	-89
Propagation Condition		All	ETU70			

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.20.4B.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.21

8.22 E-UTRAN Discovery Signal Measurements

8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

8.22.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.22.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.1.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_SCE\_DRX}$.

$$T_{identify\_intra\_SCE\_DRX} = 16 * Max \{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} + T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ is the intra-frequency period for measurements as shown in table 8.22.1.3-1

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_FDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ as shown in table 8.22.1.3-1, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$.

Table 8.22.1.3-1: Requirement to measure FDD intra frequency cell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_FDD\_CRS\_DRX}$ [ms]
≥ 6	≥1	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }
≥ 25	≥1	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.1.1.2 and A.8.22.1.

8.22.1.4 Test description

8.22.1.4.1 Initial conditions

Same Initial conditions as defined in clause 8.1.3.4.1 with the following exceptions:

- Instead of Table 8.1.3.4.1-1 -> use Table 8.22.1.4.1-1.
- Instead of clause 8.1.3.4.3 -> use clause 8.22.1.4.3.

Table 8.22.1.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.1.5-2
T1	s	5	
T2	s	10	

8.22.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.1.5-1 and 8.22.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-3

Table 8.22.1.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.1.4.3-3: MeasObjectEUTRA-GENERIC(f1): Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.1.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.1.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.1.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.1.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.1.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.1.5 Test requirement

Tables 8.22.1.4.1-1, 8.22.1.5-1, 8.22.1.5-2 and 8.22.1.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test.

Table 8.22.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
$\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
RSRP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Io Note 3	dBm/9MHz	-63.17	-60.61	Specified in columns for Cell 1	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	μs	-		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.1.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.1.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_SCE\_DRX}$

$T_{identify\_intra\_SCE\_DRX}$ = 16* *Max* { $T_{DMTC\_periodicity}$, DRX cycle length}+ $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$

Where $T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

$T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ = 3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length } = 768ms

$T_{identify\_intra\_SCE\_DRX}$ = 4864ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

8.22.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.22.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_SCE\_DRX}$.

$$T_{identify\_intra\_SCE\_DRX} = 16* \max \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$ as shown in table 8.22.2.3-1, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$

Table 8.22.2.3-1: Requirement to measure TDD intra frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ [ms]
≥ 6	≥2	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }
≥ 25	≥2	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.2.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.1.2 and A.8.22.2.

8.22.2.4 Test description

8.22.2.4.1 Initial conditions

Same Initial conditions as defined in clause 8.2.2.4.1 with the following exceptions:

- Instead of Table 8.2.2.4.1-1 -> use Table 8.22.2.4.1-1.
- Instead of clause 8.2.2.4.3 -> use Table 8.22.2.4.3.

Table 8.22.2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration	ms	2	As specified in IE MeasDS-Config in TS 36.331[5]
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.2.5-2
T1	s	5	
T2	s	10	

8.22.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.22.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig-DEFAULT		
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.22.2.4.3-3: MeasObjectEUTRA-GENERIC(f1): Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.22.2.4.3-4: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.22.2.4.3-5: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.2.4.3-6: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.22.2.5 Test requirement

Tables 8.22.2.5-1, 8.22.2.5-2 and 8.22.2.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test.

Table 8.22.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98+TT			
$\hat{E}_s / N_{oc}$	dB	6.60	6.60	-Infinity	6.60
$\hat{E}_s / I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
RSRP Note 3	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
SCH_RP Note 3	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
Io Note 3	dBm/9MHz	-62.76	-60.16	Specified in columns for Cell 1	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.2.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213 [8].

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_SCE\_DRX}$

$$T_{identify\_intra\_SCE\_DRX} = 16 * Max \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$$

Where $T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms

$T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 768ms$

$T_{identify\_intra\_SCE\_DRX}$ = 4864ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

8.22.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.22.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and forward and supports CRS based discovery signals measurement. Applicability requires support for FGIs bits 5 and 25.

8.22.3.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided. The discovery signal occasion and the measurement gap should be aligned, provided that also the following additional conditions are fulfilled:

- Entire discovery signal occasion should be contained in the measurement gap.
- The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter\_SCE\_DRX}$.

$$T_{identify\_inter\_SCE\ DRX} = 17 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} * N_{freq} + T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ is the inter-frequency period for measurements as shown in Table 8.22.3.3-1. N_{freq} is defined in clause TS 36.133 [4] 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.22.3.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.3.3-1: Requirement to measure FDD inter frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_FDD\_CRS\_DRX}$ [ms]
≥ 6	≥1	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}
≥ 25	≥1	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2, and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_SCE\ DRX}$ defined in TS 36.133 [4] Clause 8.6.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_SCE\ DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered

measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.2.1 and A.8.22.3.

8.22.3.4 Test description

8.22.3.4.1 Initial conditions

Same Initial conditions as defined in clause 8.3.2.4.1 with the following exceptions:

- Instead of Table 8.3.2.4.1-1 -> use Table 8.22.3.4.1-1.
- Instead of clause 8.3.2.4.3 -> use Table 8.22.3.4.3.

Table 8.22.3.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 [4] clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 [5] clause 6.3.5
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331 [5]
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table 8.22.3.5-2
T1	s	5	
T2	s	10	

8.22.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5378 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 with Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.3.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.3.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.3.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.3.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.3.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.3.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.3.4.3-9: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.22.3.5 Test requirement

Tables 8.22.3.4.1-1, 8.22.3.5-1, 8.22.3.5-2 and 8.22.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test.

Table 8.22.3.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.3.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.3.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213 [8].

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

- Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length
- Measurement reporting delay = $T_{identify\_inter\_SCE\_DRX.}$

  $T_{identify\_inter\_SCE\ DRX} = 17 * Max \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} * N_{freq} + T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$

  Where $T_{DMTC\_periodicity}$ = 160ms,

  - DRX cycle length = 256ms.
  - $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length,MGRP}\} * N_{freq}$ = 768ms

    Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

    Gap Pattern Id = 0, MGRP = 40ms

  $T_{identify\_inter\_SCE\ DRX}$ = 5120 ms.

  TTI insertion uncertainty = 2 ms

  DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5378 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

8.22.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.22.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bits 5, and 25.

8.22.4.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter\_SCE\_DRX}$.

$$T_{identify\_inter\_SCE\_DRX} = 17 * Max \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP} \} * N_{freq} + T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.14.4 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$ is the inter-frequency period for measurements as shown in Table 8.22.4.3-1. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.22.4.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.4.3-1: Requirement to measure TDD inter frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_TDD\_CRS\_DRX}$ [ms]
≥ 6	≥2	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}
≥ 25	≥2	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2, and 9.1.14.4, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.2.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.2.2 and A.8.22.4.

8.22.4.4 Test description

8.22.4.4.1 Initial conditions

Same Initial conditions as defined in clause 8.4.2.4.1 with the following exceptions:

- Instead of Table 8.4.2.4.1-1 -> use Table 8.22.4.4.1-1.
- Instead of clause 8.4.2.4.3 -> use Table 8.22.4.4.3.

Table 8.22.4.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	2	As specified in IE MeasDS-Config in TS 36.331
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table A.8.22.4.1-3
T1	s	5	
T2	s	10	

8.22.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and The SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.4.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5378 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.4.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 with the Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.4.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.22.4.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	2		
}			
}			
}			
}			

Table 8.22.4.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.4.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.4.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.4.4.3-7: *MeasResults:* Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.4.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.22.4.4.3-9: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.22.4.5 Test requirement

Tables 8.22.4.5-1, 8.22.4.5-2 and 8.22.4.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test.

Table 8.22.4.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		3 (Synchronous cells)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.4.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.4.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213 [8].

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

- Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length
- Measurement reporting delay = $T_{identify\_inter\_SCE\_DRX.}$

  $T_{identify\_inter\_SCE\ DRX} = 17 * Max \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} * N_{freq} + T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$

  Where:

  - $T_{DMTC\_periodicity}$ = 160ms,
  - DRX cycle length = 256ms.
  - $T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length,MGRP}\} * N_{freq}$ = 768ms
    - Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.
    - Gap Pattern Id = 0, MGRP = 40ms
- $T_{identify\_inter\_SCE\ DRX}$ = 5120 ms.
- TTI insertion uncertainty = 2 ms
- DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5378 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

8.22.5.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in TS 36.133 [4] clause 8.6.3.1.1.2.

8.22.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.5.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency TP within $T_{identify\_intra\_TP\_SCE\_DRX}$.

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band.

$T_{identify\_intra\_SCE\_DRX}$ is the intra-frequency period for cell identification in TS 36.133 [4] section 8.6.2.1.1.2. $T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$ is the intra-frequency period for TP measurement as shown in table 8.22.5.3-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_intra\_FDD\_CSI\text{-}RS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$ as shown in table 8.22.5.3-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$.

Table 8.22.5.3-1: Requirement to measure FDD intra frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_FDD\_CSI\text{-}RS\_DRX}$ [ms]
≥ 6	≥1	5**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}
≥ 25	≥1	3**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.1.1.2 and A.8.22.5.

8.22.5.4 Test description

8.22.5.4.1 Initial conditions

Same initial conditions as defined in clause 8.1.3.4.1 with the following exceptions:

- Instead of Table 8.1.3.4.1-1 -> use Table 8.22.5.4.1-1.
- Instead of clause 8.1.3.4.3 -> use clause 8.22.5.4.3.

Table 8.22.5.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion duration	ms	1	
c2-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.5.5-2
Time offset between cells		2.3 μs	CP/2 or Synchronous cells
T1	s	5	
T2	s	10	

8.22.5.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C2 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.5.5-1 and 8.22.5.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event C2. If the overall delays measured from the beginning of time period T2 is less than 5890ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.5.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.7-3

Table 8.22.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.5.4.3-3: *MeasObjectEUTRA-GENERIC(f1)*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.5.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.5.4.3-5: *ReportConfigEUTRA-C2*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-11: ReportConfigEUTRA-C2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C2 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC2-r12 SEQUENCE {			
c2-RefCSI-RS-r12	1		
c2-Offset-r12	-12 (-6dB)	-6 is actual value in dB (-12*0.5 dB)	
c2-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.5.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.5.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.5.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 8.22.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.5.5 Test requirement

Tables 8.22.5.4.1-1, 8.22.5.5-1, 8.22.5.5-2 and 8.22.5.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal test.

Table 8.22.5.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1		DL Reference Measurement Channel R.0 FDD as in A.1.1	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1		DL Reference Measurement Channel R.6 FDD as in A.2.1	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s / N_{oc}$	dB	6.10	6.10	-Infinity	6.10
CSI-RS $\hat{E}_s / N_{oc}$	dB	12.10	12.10	-Infinity	12.10
CRS $\hat{E}_s / I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
CSI-RS $\hat{E}_s / I_{ot}$	dB	12.10	5.05	-Infinity	5.05
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
CSI-RSRP Note 4	dBm/15 KHz	-85.90	-85.90	-Infinity	-85.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Io	dBm/9 MHz	-63.17	-60.61	Specified in columns for cell1	
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Propagation Condition		ETU30		ETU30	
Timing offset to cell 1	us	-		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, CSI-RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.5.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.5.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213 [8].

The UE shall send one Event C2 triggered measurement report, with a measurement reporting delay less than 5890ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C2 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_TP\_SCE\_DRX}$

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX}$

Where

$T_{identify\_intra\_SCE\_DRX} = 16 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\ \_intra\_FDD\_CRS\_DRX,}$

$T_{Measurement\_Period\ \_intra\_FDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length } \},$

$T_{Measurement\_Period\ \_intra\_FDD\_CSI\text{-}RS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length } \} = 768ms,$

$T_{DMTC\_periodicity} = 160ms,$

DRX cycle length = 256ms.

$T_{identify\_intra\_TP\_SCE\_DRX} = 22 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} = 5632ms$

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5890ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

8.22.6.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX based on CSI-RS based discovery signal under fading propagation conditions within the E-UTRA TDD-TDD intra frequency cell search requirements.

8.22.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.6.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency TP within $T_{identify\_intra\_TP\_SCE\_DRX}$.

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band

$T_{identify\_intra\_SCE\_DRX}$ is the intra-frequency period for cell identification as shown in section 8.22.2.3. $T_{Measurement\_Period\_intra\_TDD\_CSI\text{-}RS\_DRX}$ is the intra-frequency period for TP measurement as shown in Table 8.22.6.3-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_intra\_TDD\_CSI\text{-}RS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX}$ as shown in table 8.22.6.3-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX}$.

Table 8.22.6.3-1: Requirement to measure TDD intrafrequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_TDD\_CSI\text{-}RS\_DRX}$ [ms]
≥ 6	≥2	$5*Max\{T_{DMTC\_periodicity}$, DRX cycle length$\}$
≥ 25	≥2	$3*Max\{T_{DMTC\_periodicity}$, DRX cycle length$\}$

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in clause TS 36.133 [4] 8.6.3.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_intra\_TDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.1.2.2 and A.8.22.6.

8.22.6.4 Test description

8.22.6.4.1 Initial conditions

Same Initial conditions as defined in clause 8.2.2.4.1 with the following exceptions:

- Instead of Table 8.2.2.4.1-1 -> use Table 8.22.6.4.1-1.
- Instead of clause 8.2.2.4.3 -> use clause 8.22.6.4.3.

Table 8.22.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
DMTC period [5]	ms	160	
DMTC period offset [5]	ms	10	
Discovery signal occasion duration	ms	2	
c2-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.6.5-2
T1	s	5	
T2	s	10	

8.22.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C2 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.6.5-1 and 8.22.6.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event C2. If the overall delays measured from the beginning of time period T2 is less than 5890ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions for DRS measurement based on CSI-RS with DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.7-3

Table 8.22.6.4.3-2: *RRCConnectionReconfiguration*

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.6.4.3-3: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.6.4.3-4: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.6.4.3-5: *ReportConfigEUTRA-C2*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-11: ReportConfigEUTRA-C2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C2 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC2-r12 SEQUENCE {			
c2-RefCSI-RS-r12	1		
c2-Offset-r12	-12 (-6dB)	-6 is actual value in dB (-12*0.5 dB)	
c2-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.6.4.3-6: *MAC-MainConfig-RBC*s

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.6.4.3-6: *SchedulingRequest-Config-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.6.4.3-7: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
measResultCSI-RS-List-r12	MeasResultCSI-RS-List-r12		
}			
}			

Table 8.22.6.4.3-8: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.6.4.3-9: *MeasResultCSI-RS-List-r12*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			

8.22.6.5 Test requirement

Tables 8.22.6.4.1-1, 8.22.6.5-1, 8.22.6.5-2 and 8.22.6.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CSI-RS based discovery signal test.

Table 8.22.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD as in A.1.2		DL Reference Measurement Channel R.0 TDD as in A.1.2	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2		DL Reference Measurement Channel R.6 TDD as in A.2.2	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s / N_{oc}$	dB	6.60	6.60	-Infinity	6.60
CSI-RS $\hat{E}_s / N_{oc}$	dB	12.60	12.60	-Infinity	12.60
CRS $\hat{E}_s / I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
CSI-RS $\hat{E}_s / I_{ot}$	dB	12.60	5.14	-Infinity	5.14
RSRP Note 4	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
CSI-RSRP Note 4	dBm/15 KHz	-85.40	-85.40	-Infinity	-85.40
Io	dBm/9 MHz	-62.76	-60.16	Specified in columns for cell1	
SCH_RP Note 4	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	0		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, CSI-RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.6.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 8.22.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section10.1 in TS 36.213 [8].

The UE shall send one Event C2 triggered measurement report, with a measurement reporting delay less than 5632 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C2 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_TP\_SCE\_DRX}$

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX}$

Where $T_{identify\_intra\_SCE\_DRX} = 16 * Max \{T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\ \_intra\_TDD\_CRS\_DRX}$

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

$T_{Measurement\_Period\ \_intra\_TDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 768ms$

$T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 768ms$

$T_{identify\_intra\_SCE\_DRX} = 19 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 4864$ ms.

$T_{identify\_intra\_TP\_SCE\_DRX} = 22 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 5632$ ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5890 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

8.22.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.22.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGIs bits 5 and 25.

8.22.7.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency TP within $T_{identify\_inter\_TP\_SCE\_DRX}$ according to the following expression:

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band.

$T_{identify\_inter\_SCE\_DRX}$ is the inter-frequency period for cell identification as shown in TS 36.133 [4] section 8.6.2.2.1.2. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1. $T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.22.7.3-1.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.14.3, with measurement period given by table 8.22.7.3-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.22.7.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.7.3-1: Requirement to measure FDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_FDD\_CSI-RS\_DRX}$ [ms]
≥ 6	≥1	5**Max*{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}
≥ 25	≥1	3**Max*{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.2.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.2.1.2 and A.8.22.7.

8.22.7.4 Test description

8.22.7.4.1 Initial conditions

Same Initial conditions as defined in clause 8.3.2.4.1 with the following exceptions:

- Instead of Table 8.3.2.4.1-1 -> use Table 8.22.7.4.1-1.
- Instead of clause 8.3.2.4.3 -> use Table 8.22.7.4.3.

Table 8.22.7.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1,2	Two FDD carrier frequency is used.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion duration	ms	1	
C1-Threshold	dB	-96	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.7.5-2
T1	s	5	
T2	s	10	

8.22.7.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C1 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Time Alignment Timer to keep the UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Time Alignment Timer in order to keep the UE uplink time alignment.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.7.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 6146 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-9 with Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.7.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.7.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.5.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.7.4.3-5: *ReportConfigEUTRA-C1*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirement

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	44 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.7.4.3-6: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.7.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.7.4.3-8: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 8.22.7.4.3-9: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.7.5 Test requirement

Tables 8.22.7.4.1-1, 8.22.7.5-1, 8.22.7.5-2 and 8.22.7.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test.

Table 8.22.7.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1		DL Reference Measurement Channel R.0 FDD as in A.1.1	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1		DL Reference Measurement Channel R.6 FDD as in A.2.1	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2_FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.2
CSI-RS $\hat{E}_s / N_{oc}$	dB	10	10	-Infinity	13.2
CRS $\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7.2
CSI-RS $\hat{E}_s / I_{ot}$	dB	10	10	-Infinity	13.2
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-90.8
CSI-RSRP Note 4	dBm/15 KHz	-88	-88	-Infinity	-84.8
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-90.8
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	-		3us	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, CSI-RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.7.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213 [8].

The UE shall send one Event C1 triggered measurement report, with a measurement reporting delay less than 6146ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C1 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\_inter\_FDD\_CSI\text{-}RS\_DRX}$

$T_{identify\_inter\_SCE\ DRX} = 17 * Max\ \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\} * N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX}$

$T_{Measurement\_Period\_inter\_FDD\_CSI\text{-}RS\_DRX} = 3*Max\{T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}*N_{freq}$

$T_{identify\_inter\_TP\_SCE\_DRX} = 23*Max\{T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}*N_{freq}$

Where:

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

Gap Pattern Id = 0, MGRP = 40ms

$T_{identify\_inter\_TP\_SCE\_DRX}$ = 5888 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 6146 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal

8.22.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX based on CSI-RS based discovery signal under fading propagation conditions within the E-UTRA TDD-TDD inter-frequency cell search requirements.

8.22.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5 and 25.

8.22.8.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency TP within $T_{identify\_inter\_TP\_SCE\_DRX}$ according to the following expression:

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\ \_inter\_TDD\_CSI\text{-}RS\_DRX}$

A TP shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band.

$T_{identify\_inter\_SCE\_DRX}$ is the inter-frequency period for cell identification as shown in TS 36.133 [4] section 8.6.2.2.2.2. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1. $T_{Measurement\_Period\ \_inter\_TDD\_CSI\text{-}RS\_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.22.8.3-1.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.14.3, with measurement period given by table 8.22.8.3-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.22.8.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.8.3-1: Requirement to measure TDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_TDD\_CSI\text{-}RS\_DRX}$ [ms]
≥ 6	≥2	5**Max*{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}
≥ 25	≥2	3**Max*{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.2.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_inter\_TP\_SCE\_DRX}$ in TS 36.133 [4] clause 8.6.3.2.2.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_TDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.2.2.2 and A.8.22.8.

8.22.8.4 Test description

8.22.8.4.1 Initial conditions

Same Initial conditions as defined in clause 8.4.2.4.1 with the following exceptions:

- Instead of Table 8.4.2.4.1-1 -> use Table 8.22.8.4.1-1.
- Instead of clause 8.4.2.4.3 -> use clause 8.22.8.4.3.

Table 8.22.8.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Test 1	Comment
		Value	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133[4] clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
Uplink-downlink configuration		1	As specified in TS 36.211 [9] clause 4.2 Table 4.2-2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
DMTC period [5]	ms	160	
DMTC period offset [5]	ms	10	
Discovery signal occasion duration	ms	2	
C1-Threshold	dB	-96	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-3 in TS 36.211 [9]
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table 8.22.8.5-2
T1	s	5	
T2	s	10	

8.22.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C1 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two

successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and The SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.8.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event C1. If the overall delays measured from the beginning of time period T2 is less than 6146 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.8.4.3 Message contents

Table 8.22.8.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions for DRS measurement based on CSI-RS with DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-9 with the Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.8.4.3-2: *RRCConnectionReconfiguration*

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.8.4.3-3: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.8.4.3-4: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.8.4.3-5: *ReportConfigEUTRA-C1*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	47 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.8.4.3-6: *MAC-MainConfig-RBC*s

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.8.4.3-6: *SchedulingRequest-Config-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.8.4.3-7: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
measResultCSI-RS-List-r12	MeasResultCSI-RS-List-r12		
}			
}			

Table 8.22.8.4.3-8: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.8.4.3-9: *MeasResultCSI-RS-List-r12*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			

8.22.8.5 Test requirement

Tables 8.22.8.4.1-1, 8.22.8.5-1, 8.22.8.5-2 and 8.22.8.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CSI-RS based discovery signal test.

Table 8.22.8.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD as in A.1.2		DL Reference Measurement Channel R.0 TDD as in A.1.2	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2		DL Reference Measurement Channel R.6 TDD as in A.2.2	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	7.2
CSI-RS $\hat{E}_s / N_{oc}$	dB	10	10	-Infinity	13.2
CRS $\hat{E}_s / I_{ot}$	dB	4	-1.46+TT	-Infinity	-1.46+TT
CSI-RS $\hat{E}_s / I_{ot}$	dB	10	4.54+TT	-Infinity	4.54+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-90.84
CSI-RSRP Note 4	dBm/15 KHz	-88	-88	-Infinity	-84.8
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-90.8
Io Note 4	dBm/9 MHz	-64.76	-64.76	-70.22	-62.26
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, CSI-RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.8.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 8.22.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5]and section10.1 in TS 36.213 [8].

The UE shall send one Event C1 triggered measurement report, with a measurement reporting delay less than 5888 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C1 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter\_TP\_SCE\_DRX}$

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\ \_inter\_TDD\_CSI\text{-}RS\_DRX}$

Where $T_{identify\_inter\_SCE\_DRX} = 17 * Max \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\} * N_{freq} + T_{Measurement_Period_inter_TDD_CRS_DRX}$

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

MGRP = 40ms,

N_{freq} = 1,

$T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX} = 3 * Max \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}$

$T_{Measurement\_Period\ \_inter\_TDD\_CSI\text{-}RS\_DRX} = 3 * Max \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}$

$T_{identify\_inter\_SCE\_DRX} = 20 * Max \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}$

$T_{identify\_intra\_TP\_SCE\_DRX} = 23 * Max \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP$\}$ = 5888 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 6146 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

8.22.9.1 Test purpose

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [6] when CRS based discovery signal is configured within the requirements stated in TS 36.133 [4] clause 8.7.2.4.1.

8.22.9.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 12 and forward that support [CA and CRS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.9.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc\_SCE}$, according to the parameter *measCycleSCell* where $T_{identify\_scc\_CRS}$ = 13 **measCycleSCell*+ $T_{measure\_scc\_CRS}$

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Clause 9.1.15 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell* shown in Tables 8.22.9.3-1 and 8.22.9.3-2.

Table 8.22.9.3-1: Requirement to measure intra frequency cell on FDD SCC with deactivated SCell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CRS}$ [ms]
≥ 6	≥1	5* *measCycleSCell*
≥ 25	≥1	3 * *measCycleSCell*

Table 8.22.9.3-2: Requirement to measure intra frequency cell on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CRS}$ [ms]
≥ 6	≥2	5* *measCycleSCell*
≥ 25	≥2	3 * *measCycleSCell*

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc\_CRS}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_CRS}$ defined in TS 36.133 [4] Clause 8.7.2.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc\_SCE}$ defined in TS 36.133 [4] clause 8.7.2.4.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.2.4.1 and A.8.22.9.

8.22.9.4 Test description

8.22.9.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 -> use Table 8.22.9.4.1-1.
- Instead of clause 8.16.1.4.3 -> use clause 8.22.9.4.3.

Table 8.22.9.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.14.2 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.14.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	10	
T2		s	10	
T3		s	5	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.9.4.2 Test procedure

It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.22.9.4.3.
4. Set the parameters according to T1 in Table 8.22.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.9.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 5122ms, then count a success for the event "A6". Otherwise count a fail for the event "A6".

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.22.9.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 482ms, then count a success for the event "Cell 1 A2". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 1 A2" is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 962ms, then count a success for the event "Cell 2 A2". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A2" is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events "A6", "Cell 1 A2" and "Cell 2 A2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.22.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.9.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.9.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.9.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.9.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.16.2.4.3-6: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.9.4.3-7: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.22.9.4.3-8: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			

Table 8.22.9.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

8.22.9.5 Test requirement

Table 8.22.9.4-1 and Table 8.22.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CRS based discovery signal.

Table 8.22.9.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	-0.15	-4.96	-infinity	-0.25	-4.70
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
Io Note 3	dBm/9MHz	-53.97	-53.97	-71.45	-53.97	-51.08	-70.25	Specified in columns for Cell 2		
Propagation Condition		ETU30			ETU30			ETU30		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			-		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		
Timing offset to Cell 2	µs	-			-			2.3 (CP/2)		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_SCE}$

$T_{identify\_scc\_CRS} = 13 * measCycleSCell + T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 * measCycleSCell$

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 16 * measCycleSCell = 5120$ ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5122 ms from the beginning of time T2 (note: this gives a total of 5120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.2.1 in which $T_{Measurement_Period\ intra_FDD_CRS} = 3 * T_{DMTC_periodicity} = 480$ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CRS}$

where $T_{measure\_scc\_CRS} = 3 * measCycleSCell$.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

8.22.10.1 Test purpose

Same test purpose as in clause 8.22.9.1.

8.22.10.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 12 and forward that support [CA and CRS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.22.9.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.2.4.1 and A.8.22.10.

8.22.10.4 Test description

8.22.10.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 -> use Table 8.22.10.4.1-1.
- Instead of clause 8.16.2.4.3 -> use clause 8.22.10.4.3.

Table 8.22.10.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration		ms	2	As specified in IE MeasDS-Config in TS 36.331 [5]
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.14.2 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.14.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	10	
T2		s	10	
T3		s	5	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.10.4.2 Test procedure

Same test procedure as in clause 8.22.9.4.2 with the following exceptions:

- Instead of clause 8.22.9.4.3 for message content exceptions → use clause 8.22.10.4.3.
- Instead of Table 8.22.9.5-1 → use Table 8.22.10.5-1.

8.22.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.10.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.10.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.10.4.3-3: *RadioResourceConfigCommonSCell-r10*

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.10.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.16.2.4.3-6: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.10.4.3-7: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.22.10.4.3-8: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			

Table 8.22.10.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			

8.22.10.5 Test requirement

Table 8.22.10.4-1 and Table 8.22.10.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CRS based discovery signal.

Table 8.22.10.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	-0.15	-4.96	-infinity	-0.25	-4.70
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
Io Note 3	dBm/9MHz	-53.97	-53.97+TT	-71.45	-53.97	-51.08	-70.25	Specified in columns for Cell 2		
Propagation Condition		ETU30			ETU30			ETU30		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			-		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		
Timing offset to Cell 2	µs	-			-			2.3 (CP/2)		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_SCE}$

$T_{identify\_scc\_CRS} = 13 * measCycleSCell + T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 * measCycleSCell$

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 16 * measCycleSCell = 5120$ ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5122 ms from the beginning of time T2 (note: this gives a total of 5120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.2.1 in which $T_{Measurement_Period\ intra_TDD_CRS} = 3 * T_{DMTC_periodicity} = 480$ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CRS}$

where $T_{measure\_scc\_CRS} = 3 * measCycleSCell$.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

8.22.11.1 Test purpose

The purpose of this test is to verify that the UE correctly detects events C1 (CSI-RS resource becomes better than threshold) defined in TS 36.331 [6] when CSI-RS based discovery signal is configured within the requirements stated in TS 36.133 [4] clause 8.7.3.4.1.

8.22.11.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 12 and forward that support CA and CSI-RS based discovery signals measurement.

8.22.11.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD TP on a secondary component carrier within $T_{identify\_scc\_TP\_SCE}$, according to the parameter *measCycleSCell*, where $T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI\text{-}RS}$,

A cell shall be considered detectable when

- CSI-RSRP related side condition given in TS 36.133 [4] Clause 9.1.15 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band

$T_{identify\_scc\_SCE}$ is the intra-frequency period for cell identification in TS 36.133 [4]section 8.7.2.4.1. $T_{measure\_scc\_CSI\text{-}RS}$ is the intra-frequency period for TP measurement in table 8.22.11.3-1.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI\text{-}RS}$ according to the parameter *measCycleSCell* as shown in tables 8.22.11.3-1 and 8.22.11.3-1.

Table 8.22.11.3-1: Requirement to measure intra frequency TP on FDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CSI\text{-}RS}$ [ms]
≥ 6	≥1	5* *measCycleSCell*
≥ 25	≥1	3* *measCycleSCell*

Table 8.22.11.3-2: Requirement to measure intra frequency TP on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CSI\text{-}RS}$ [ms]
≥ 6	≥2	5* *measCycleSCell*
≥ 25	≥2	3* *measCycleSCell*

The UE shall be capable of performing RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc\_CSI\text{-}RS}$.

The measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$ defined in Clause 8.7.3.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_scc\_TP\_SCE}$ defined in TS 36.133 [4] clause 8.7.3.4.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc\_CSI\text{-}RS}$ provided the timing to that TP has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.3.4.1 and A.8.22.11.

8.22.11.4 Test description

8.22.11.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 > use Table 8.22.11.4.1-1.
- Instead of clause 8.16.1.4.3 > use clause 8.22.11.4.3.

Table 8.22.11.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
C1	Hysteresis	dB	0	Hysteresis for evaluation of event C1.
	Threshold CSI-RSRP	dBm	-90	Actual RSRP threshold for event C1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.14.3 into account plus margin.
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	
T2		s	5	
T3		s	10	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.11.4.2 Test procedure

It is indicated to the UE in the measurement control information that event-triggered reporting with Events C1 (CSI-RS resource becomes better than threshold) is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 and T2 the UE shall not have any information on cell 3. Immediately at beginning of T3 the transmission power of cell 3 is increased above a threshold value and this shall result in reporting of Event C1. At beginning of T2 the transmission powers of cells 1, 2 are increased abovea threshold value and this shall result in reporting of Event C1 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.22.11.4.3.

4. Set the parameters according to T1 in Table 8.22.11.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with eventsC1 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.11.5-1.

8. The UE shall transmit MeasurementReport messages triggered by Event C1 for Cell 1 and Cell 2, respectively.

8a. If the measurement reporting delay for Cell 1 from the beginning of time period T2 is less than 482ms, then count a success for the event “Cell 1 C1”. If the UE sends event-triggered measurement reports before the beginning of time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 C1” is increased by one.

8b. If the measurement reporting delay for Cell 2 from the beginning of time period T2 is less than 962ms, then count a success for the event “Cell 2 C1”. If the UE sends event-triggered measurement reports before the beginning of time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 C1” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.22.11.5-1.

10. The UE shall transmit a MeasurementReport message triggered by Event C1. If the measurement reporting delay from the beginning of time period T3 is less than 6082ms, then count a success for the event "Cell 3 C1". Otherwise count a fail for the event "Cell 3 C1".

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events "Cell 1 C1", "Cell 2 C1" and "Cell3 C1" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.22.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.10.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.1-5

Table 8.22.10.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.10.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.10.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-C1		
reportConfig[1]	ReportConfig-C1		
reportConfigId[2]	IdReportConfig-C1		
reportConfig[2]	ReportConfig-C1		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-C1		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-C1		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-C1		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.6.4.3-6: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	1		
csi-RS-IndividualOffset-r12	1		
}			
}			
}			
}			
}			

Table 8.16.2.4.3-7: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.10.4.3-8: *ReportConfig-C1*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	50 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.10.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			

Table 8.22.6.4.3-10: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

8.22.11.5 Test requirement

Table 8.22.11.4-1 and Table 8.22.11.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CSI-RS based discovery signal.

Table 8.22.11.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1			DL Reference Measurement Channel R.0 FDD as in A.1.1			DL Reference Measurement Channel R.0 FDD as in A.1.1		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1			DL Reference Measurement Channel R.6 FDD as in A.2.1			DL Reference Measurement Channel R.6 FDD as in A.2.1		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note 1]	dB									
OCNG_RB[Note 1]	dB									
N_{oc}[Note 2]	dBm/15 kHz	-101			-101					
RSRP[Note 3]	dBm/15 kHz	-104	-84	-84	-104	-84	-84	-infinity	-infinity	-84
CSI-RSRP[Note 3]	dBm/15 kHz	-98	-78	-78	-98	-78	-78	-infinity	-infinity	-78
SCH_RP[Note 3]	dBm/15 kHz	-104	-84	-84	-104	-84	-84	-infinity	-infinity	-84
CRS $\hat{E}_s/N_{oc}$	dB	-3	17	17	-3	17	17	-infinity	-infinity	17
CSI-RS $\hat{E}_s/N_{oc}$	dB	3	23	23	3	23	23	-infinity	-infinity	23
CRS $\hat{E}_s/I_{ot}$	dB	-3	17	17	-3	17	-0.09	-infinity	-infinity	-0.09
CSI-RS $\hat{E}_s/I_{ot}$	dB	3	23	23	3	23	5.91	-infinity	-infinity	5.91
CSI-RS resource configurations [9]		2			4			6		
p-C-r10 [5]	dB	-6			-6			-6		
CSI-RS periodicity	ms	10			10			10		
CSI-RS subframe offset		0			0			0		
CSI-RS individual offset [5]	[dB]	0			0			0		
CSI-RS muting		Enable			Enable			Enable		
Propagation Condition		ETU30			ETU30			ETU30		
Time offset to cell 1	us	0			0			2.3 (CP/2)		

Time alignment error relative to cell1 Note 5	us	-	≤ TAE	N/A
Timing offset to Cell 2	µs	-	-	2.3 (CP/2)

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, CSI-RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or FDD) in TS 36.133 [4] clause 8.6.3.1 in which $T_{Measurement\_Period\_intra\_FDD\_CSI-RS} = 3 * T_{DMTC\_periodicity} = 480ms$.

The UE shall send one Event C1 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T2.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI-RS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event C1 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CSI-RS}$

where $T_{measure\_scc\_CSI-RS} = 3 *$ *measCycleSCell*.

The UE shall send one Event C1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T2 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For Cell 3 during T3, the event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$

The overall delays measured test requirement for Event C1 for Cell 3 during T3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI-RS}$

$T_{identify\_scc\_SCE} = T_{identify\_scc\_CRS} = 13 *$*measCycleSCell*$+ T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 *$ *measCycleSCell*

$T_{measure\_scc\_CSI-RS} = 3 *$ *measCycleSCell*

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 19 *$*measCycleSCell* = 6080 ms

The UE shall send one Event C1 triggered measurement report for cell 3 with a measurement reporting delay of less than 6082 ms from the beginning of time T3 (note: this gives a total of 6080 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event C1 for different cells.

Decide the test pass, if events C1 for all the cells are passed, otherwise fail the UE.

8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

8.22.12.1 Test purpose

Same test purpose as in clause 8.22.11.1.

8.22.12.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 12 and forward that support CA and CSI-RS based discovery signals measurement.

8.22.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.22.11.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.3.4.1 and A.8.22.12.

8.22.12.4 Test description

8.22.12.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 -> use Table 8.22.12.4.1-1.
- Instead of clause 8.16.2.4.3 -> use clause 8.22.12.4.3.

Table 8.22.12.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
C1	Hysteresis	dB	0	Hysteresis for evaluation of event C1.
	Threshold CSI-RSRP	dBm	-90	Actual RSRP threshold for event C1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	
T2		s	5	
T3		s	10	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.12.4.2 Test procedure

Same test procedure as in clause 8.22.11.4.2 with the following exceptions:

- Instead of clause 8.22.11.4.3 for message content exceptions → use clause 8.22.10.4.3.
- Instead of Table 8.22.11.5-1 → use Table 8.22.12.5-1.

8.22.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.12.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.1-5

Table 8.22.12.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.12.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.12.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-C1		
reportConfig[1]	ReportConfig-C1		
reportConfigId[2]	IdReportConfig-C1		
reportConfig[2]	ReportConfig-C1		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-C1		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-C1		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-C1		
}			
}			

Table 8.22.12.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.22.12.4.3-6: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	1		
csi-RS-IndividualOffset-r12	1		
}			
}			
}			
}			
}			

Table 8.22.12.4.3-7: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.12.4.3-8: *ReportConfig-C1*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	47 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.12.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			

Table 8.22.12.4.3-10: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

8.22.12.5 Test requirement

Table 8.22.12.4-1 and Table 8.22.12.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CSI-RS based discovery signal.

Table 8.22.12.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD As in A.1.2			DL Reference Measurement Channel R.0 TDD As in A.1.2			DL Reference Measurement Channel R.0 TDD As in A.1.2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2			DL Reference Measurement Channel R.6 TDD as in A.2.2			DL Reference Measurement Channel R.6 TDD as in A.2.2		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2_TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101			-101					
RSRP Note 3	dBm/15 kHz	-104	-84	-84	-104	-84	-84	-infinity	-infinity	-84
CSI-RSRP Note 3	dBm/15 kHz	-98	-78	-78	-98	-78	-78	-infinity	-infinity	-78
SCH_RP Note 3	dBm/15 kHz	-104	-84	-84	-104	-84	-84	-infinity	-infinity	-84
CRS $\hat{E}_s/N_{oc}$	dB	-3	17	17	-3	17	17	-infinity	-infinity	17
CSI-RS $\hat{E}_s/N_{oc}$	dB	3	23	23	3	23	23	-infinity	-infinity	23
CRS $\hat{E}_s/I_{ot}$	dB	-3	17	17	-3	17	-0.09	-infinity	-infinity	-0.09
CSI-RS $\hat{E}_s/I_{ot}$	dB	3	23	23	3	23	5.91	-infinity	-infinity	5.91
Propagation Condition		ETU30								
CSI-RS resource configurations [9]		0			2			4		
CSI-RS subframe offset		0			0			0		
CSI-RS individual offset [5]	[dB]	0			0			0		
CSI-RS muting		Enable			Enable			Enable		
p-C-r10 [5]	dB	-6			-6			-6		
CSI-RS periodicity	ms	10			10			10		
Time offset to cell 1	us	0			0			2.3 (CP/2)		
Time alignment error relative to cell1 Note 5	us	-			≤ TAE			N/A		
Timing offset to Cell 2	µs	-			-			2.3 (CP/2)		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.3.1 in which $T_{Measurement\_Period\_intra\_TDD\_CSI-RS} = 3 * T_{DMTC\_periodicity} = 480ms$.

The UE shall send one Event C1 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T2.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI-RS}$ according to the parameter *measCycleSCell.*

The overall delays measured test requirement for Event C1 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CSI-RS}$

where $T_{measure\_scc\_CSI-RS} = 3 *$ *measCycleSCell.*

The UE shall send one Event C1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T2 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For Cell 3 during T3, the event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$

The overall delays measured test requirement for Event C1 for Cell 3 during T3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI-RS}$

$T_{identify\_scc\_SCE} = T_{identify\_scc\_CRS} = 13 *$*measCycleSCell*$+ T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 *$ *measCycleSCell*

$T_{measure\_scc\_CSI-RS} = 3 *$ *measCycleSCell*

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 19 *$*measCycleSCell* = 6080 ms

The UE shall send one Event C1 triggered measurement report for cell 3 with a measurement reporting delay of less than 6082 ms from the beginning of time T3 (note: this gives a total of 6080 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event C1 for different cells.

Decide the test pass, if events C1 for all the cells are passed, otherwise fail the UE.

8.23 E-UTRAN Dual Connectivity Measurements

8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

8.23.1.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.23.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of synchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.1.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.1.3-1.

Table 8.23.1.3-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.1.3-2 The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.1.3-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.3, 8.1.2.2 and A.8.23.1.

8.23.1.4 Test description

8.23.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.1.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2..

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.1.4.3.
5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.1.4.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.1.5.1-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	2	
T2		s	10	
T3		s	1	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1.				
Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.1.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A1 (PCell and PSCell) and A2 (PCell and PSCell) is used. The test consists of three successive time periods, with time durations of T1, T2 and T3, respectively. During time duration T1, the UE shall not have any timing information of Cell 2. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired. Immediately at beginning of T2 the transmission powers of Cell1 and Cell2 are reduced below a threshold value of event A2 and this shall result in reporting of Event A2 for PCell and PSCell, respectively. Immediately after receiving the reporting of event A2 for both PCell and PSCell, PDCCH indicating a new transmission on Cell1 shall be sent continuously to ensure that the UE would not enter the DRX state on MCG throughout T3. At beginning of T3 the transmission powers of Cell1 and Cell2 are increased above a threshold value of event A1 and this shall result in reporting of Event A1 for PCell and PSCell, respectively.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.1.4.3.
4. Set the parameters according to T1 in Table 8.23.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A2 and A1 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.1.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A2 for Cell1 and Cell2. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms for Cell1 or less than 402ms for Cell2, then count a success for the event "A2". Otherwise count a fail for the event "A2".

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.23.1.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A1 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms for Cell1, then count a success for the event "Cell 1 A1". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 1 A1" is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 402ms, then count a success for the event "Cell 2 A1". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A1 is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 2 = physical cell identity of Cell 1 then skip this physical cell identity value for Cell 2.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events "A2", "Cell 1 A1" and "Cell 2 A1" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.23.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.1.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.1.4.3-3: MeasConfig: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A2		
reportConfig[1]	ReportConfig-A2		
reportConfigId[2]	IdReportConfig-A1		
reportConfig[2]	ReportConfig-A1-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	2 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A2		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A1		
}			
}			

Table 8.23.1.4.3-4: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.23.1.4.3-5: *ReportConfig-A1*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	45	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.23.1.4.3-6: *ReportConfig-A2*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	41	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.23.1.5 Test requirement

Tables 8.23.1.4.1-1 and 8.23.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s / N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s / I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	µs	-			33		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.
Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.1.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

8.23.2.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.23.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of asynchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.2.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.2.3-1.

Table 8.23.2.3-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.1 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.2.3-2 The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.2.3-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.3, 8.1.2.2 and A.8.23.2.

8.23.2.4 Test description

8.23.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.2.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.2.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier. Cell 2 is PSCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.Table 8.23.2.4.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.2.5-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	2	
T2		s	10	
T3		s	1	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.2.4.2 Test procedure

Same test procedure as in clause 8.23.1.4.2 with the following exceptions:

- Instead of message content exceptions defined in clause 8.23.1.4.3 → use message content exception defined in clause 8.23.2.4.3.

- Instead of Table 8.23.1.5-1 → use Table 8.23.2.5-1

8.23.2.4.3 Message contents

Same message contents as in clause 8.23.1.4.3.

8.23.2.5 Test requirement

Tables 8.23.2.4.1-1 and 8.23.2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.23.2.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s / N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s / I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	μs	-			500		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.
Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.2.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

8.23.3.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra-frequency cell search requirements.

8.23.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of synchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.3.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.3.3-1.

Table 8.23.3.3-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use. NOTE2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133[4] Clause 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133[4] Clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133[4] Annex B.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.3.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.3.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use. NOTE2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T identify_intra defined in TS 36.133[4] Clause 8.1.2.2.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133[4] clause 8.1.2.2.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than Tmeasure_intra provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.4, 8.1.2.2 and A.8.23.3.

8.23.3.4 Test description

8.23.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.3.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.3.4.3.
5. There are two E-UTRA TDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.3.4.1-1: General test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX			ON	DRX related parameters are defined in Table 8.23.3.5-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	10	
T3		s	1	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1.				

8.23.3.4.2 Test procedure

Same test procedure as in clause 8.23.1.4.2 with the following exceptions:

- Instead of message content exceptions defined in clause 8.23.1.4.2 → use message content exception defined in clause 8.23.3.4.3.

- Instead of Table 8.23.1.5-1 → use Table 8.23.3.5-1

8.23.3.4.3 Message contents

Same message contents as in clause 8.23.1.4.3.

8.23.3.5 Test requirement

Tables 8.23.3.4.1-1 and 8.23.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.3.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s / N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s / I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	µs	-			33		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.
Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.3.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.3.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

8.23.4.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.23.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.4.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.4.3-1

Table 8.23.4.3-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles), normal performance		$T_{identify\_inter}$ (s) (DRX cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,n}$ ($30*K_n*N_{freq,n}$)	$5.12*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($30*K_r*N_{freq,r}$)
0.32	$6.4*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,nl}$ ($24*K_n*N_{freq,n}$)	$6.4*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($24*K_r*N_{freq,r}$)
0.32< DRX-cycle≤2.56	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_r*N_{freq,r}$)	Note ($20*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band
- other RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled.
- $SCH\_RP|_{dBm}$ SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.4.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.4.3-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal performance)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 provided the timing to that cell has not changed more than $\pm$ 50 T_s while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.4, 8.1.2.3 and A.8.23.4.

8.23.4.4 Test description

8.23.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.4.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in 3GPP TS 36.508 [7] Annex A figure group A.43 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.4.4.3.
5. There are three E-UTRA FDD cells in the test. Cell 1 is PCell, Cell 2 is PSCell and Cell 3 is a inter-frequency neighbour cell. Cell 1 and Cell 2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table A.8.23.4.4.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.4.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.6.11.				

8.23.4.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure the PCell (Cell 1) and PSCell (Cell 2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.4.4.3.
4. Set the parameters according to T1 in Table 8.23.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.4.5-1.
8. UE shall transmit a MeasurementReport message triggered by Event A3 for Cell 3 on PCell (Cell 1). If the measurement reporting delay from the beginning of time period T2 is less than 3922ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
9.. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in [State 3A] according to TS 36.508 [7] clause [4.5.3A] (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A,
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

12. Repeat steps 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.23.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.4.4.3-1: Common Exception messages for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.4.4.3-2: *RRCConnectionReconfiguration:* Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.4.4.3-3: *MeasConfig:* Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f3		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.23.4.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.23.4.5 Test requirement

Tables 8.23.4.4.1-1 and 8.23.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.4.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive Time offset to cell1 Note 4	µs	-		33		-	
Time offset to cell1	µs	-		-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.4.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.4.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

8.23.5.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.23.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.5.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.5.3-1

Table 8.23.5.3-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles), normal performance		$T_{identify\_inter}$ (s) (DRX cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,n}$ ($30*K_n*N_{freq,n}$)	$5.12*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($30*K_r*N_{freq,r}$)
0.32	$6.4*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,nl}$ ($24*K_n*N_{freq,n}$)	$6.4*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($24*K_r*N_{freq,r}$)
0.32< DRX-cycle≤2.56	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_r*N_{freq,r}$)	Note ($20*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled.
- $SCH\_RP|_{dBm}$ SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.5.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.5.3-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal performance)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.4, 8.1.2.3 and A.8.23.5.

8.23.5.4 Test description

8.23.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.5.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure group A.43 as appropriate..
2. The general test parameter settings are set up according to Table 8.23.5.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.5.4.3.
5. There are three E-UTRA FDD cells in the test. Cell1 is PCell, Cell2 is PSCell and Cell3 is a inter-frequency neighbour cell. Cell1 and Cell2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table 8.23.5.4.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.5.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.5.4.2 Test procedure

Same Test Procedure as in clause 8.23.4.4.2 with the following exceptions:

- Instead of clause 8.23.4.4.3 → use clause 8.23.5.4.3.
- Instead of Table 8.23.4.5-1 → use Table 8.23.5.5-1.

8.23.5.4.3 Message contents

Same Message contents as in clause 8.23.4.4.3.

8.23.5.5 Test requirement

Tables 8.23.5.4.1-1 and 8.23.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.23.5.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive time offset to cell1 Note 4	µs	-		500		-	
Time offset to cell1	µs	-		-		400	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.5.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

8.23.6.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter-frequency cell search requirements.

8.23.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.6.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.6.3-1.

Table 8.23.6.3-1: Requirement to identify a newly detectable TDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles) (normal performance)		$T_{identify\_inter}$ (s) (DRX cycles) (reduced performance)	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,n}$ ($30*K_n*N_{freq,n}$)	$5.12*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($30*K_r*N_{freq,r}$)
0.32	$6.4*K_n*N_{freq,n}$ ($20*K_n*N_{freq,n}$)	$7.68*K_n*N_{freq,n}$ ($24*K_n*N_{freq,n}$)	$6.4*K_r*N_{freq,r}$ ($20*K_r*N_{freq,r}$)	$7.68*K_r*N_{freq,r}$ ($24*K_r*N_{freq,r}$)
0.32<DRX-cycle≤2.56	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_n*N_{freq,n}$)	Note ($20*K_r*N_{freq,r}$)	Note ($20*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band
- RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.6.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.6.3-2: Requirement to measure TDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal requirement)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced requirement)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable
0.128	When configuration 2 non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable, Otherwise Note ($5*K_n*N_{freq,n}$)	When configuration 2 non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable, Otherwise Note ($5*K_r*N_{freq,r}$)
0.128<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] clause 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133[4] Clause 8.1.2.3.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ in TS 36.133[4] clause 8.1.2.3.2.2 and then triggers the measurement report as per TS 36.331[5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ in TS 36.133[4] clause 8.1.2.3.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133[4] clause 8.8.4, 8.1.2.3 and A.8.23.6.

8.23.6.4 Test description

8.23.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.6.5-1 as defined in TS 36.508 [7] clause 4.3.1- for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure group A.43 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.6.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.6.4.3.
5. There are three E-UTRA TDD cells in the test. Cell1 is PCell, Cell2 is PSCell and Cell3 is a inter-frequency neighbour cell. Cell1 and Cell2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table 8.23.6.4.1-1: General test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX			ON	DRX related parameters are defined in Table 8.23.6.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1.				

8.23.6.4.2 Test procedure

Same Test Procedure as in clause 8.23.4.4.2 with the following exceptions:

- Instead of clause 8.23.4.4.3 → use clause 8.23.6.4.3.
- Instead of Table 8.23.4.5-1 → use Table 8.23.6.5-1.

8.23.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.6.4.3-2: *RRCConnectionReconfiguration:* Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.6.4.3-3: *MeasConfig:* Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f3		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.23.6.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.23.6.5 Test requirement

Tables 8.23.6.4.1-1 and 8.23.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s / I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive Time offset to cell1 Note 4	µs	-		33		-	
Time offset to cell1	µs	-		-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.6.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.23.7 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Synchronous DC

Editor's note: This Test case is incomplete:

- Message content is TBD
- Test Tolerances and test system uncertainties remains

8.23.7.1 Test purpose

To verify that the PSCell addition and release delays under synchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

8.23.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of synchronous Dual Connectivity.

8.23.7.3 Minimum conformance requirements

Upon receiving PSCell addition in subframe *n*, the UE shall be capable to transmit PRACH preamble towards PSCell no later than in subframe $n+ T_{config\_PSCell}$:

Where:

$T_{config\_PSCell} = 20ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

$T_{activation\_time}$ is the PSCell activation delay. If the PSCell is known, then $T_{activation\_time}$ is 20ms. If the PSCell is unknown, then $T_{activation\_time}$ is 30ms provided the PSCell can be successfully detected on the first attempt.

T_{PCell_DU} is the delay uncertainty due to PCell PRACH preamble transmission. T_{PCell_DU} is up to 20ms if PSCell activation is interrupted by a PCell PRACH preamble transmission, otherwise it is 0.

T_{PSCell_DU} is the delay uncertainty in acquiring the first available PRACH occasion in the PSCell. T_{PSCell_DU} is up to 30ms.

PSCell is known if it has been meeting the following conditions:

During the last [5] seconds before the reception of the PSCell configuration command:

- the UE has sent a valid measurement report for the PSCell being configured and
- the PSCell being configured remains detectable according to the cell identification conditions specified in section 8.8,

- PSCell being configured also remains detectable during the PSCell configuration delay according to the cell identification conditions specified in section 8.8.

otherwise it is unknown. The PCell interruption specified in TS 36.133 section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell addition delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell addition procedure.

Upon receiving PSCell release in subframe *n*, the UE shall accomplish the release actions specified in [4] no later than in subframe *n*+20.

The PCell interruption specified in section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell release delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell release procedure.

The normative reference for this requirement is TS 36.133 [4] clause 7.14 and A.8.23.7.

8.23.7.4 Test description

8.23.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.7.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.7.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.7.4.1-1: General test parameters for known PSCell addition and release case

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Initial Condition	Active PCell		Cell1	PCell on RF channel number 1.
	Neighbour cell		Cell2	Neighbour cell on RF channel number 2.
Final Condition	Active PCell		Cell1	PCell on RF channel number 1.
	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measurement gap pattern Id			0	Gaps are configured before T2 and released before T3.
CQI/PMI periodicity and offset configuration index on cell2			0	CQI reporting for PSCell every second subframe
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of cell2.
T1		s	5	During this time the PCell shall be known and cell2 shall be unknown.
T2		s	≤ 5	During this time the UE shall identify neighbour cell (cell2) and report event A4.
T3		s	1	During this time the UE adds the PSCell.
T4		s	1	During this time the UE sends CSI reports for PSCell.
T5		s	1	During this time the UE releases the PSCell.
Note 1: Void Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in section A.3.11.				

8.23.7.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell.

The test consists of five successive time periods, with time durations of T1, T2, T3, T4 and T5, respectively.

During time duration T1, the UE shall not have any timing information of Cell 2 (Cell2 shall be unknown). Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1. Prior to the start of the time duration T2 the UE is configured with the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2) and the UE is configured with the measurement gaps (gap pattern Id # 0).

Immediately at beginning of T2 Cell2 is powered on, this shall result in reporting of Event A4 for PSCell. Immediately after receiving the reporting of event A4 the test system shall send a RRC message to the UE to release the measurement gaps. The test system shall then send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.7.4.3.
4. Set the parameters according to T1 in Table 8.23.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A4 and measurements gaps configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.7.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A4 for Cell2. After receiving the Measurement Report the test system shall send a RRC Reconfiguration message including a release of the measurement gaps. If the UE never sends a MeasurementReport triggered by Event A4 proceed to step 16.
9. The UE shall transmit an RRCConnectionReconfigurationComplete message.
10. Test system shall send a RRC Reconfiguration message to add PSCell (Cell2) on radio channel 2 and configure the UE to report periodic CSI reports for the PSCell. T3 starts when the UE receives the RRC message.
11. The UE shall transmit an RRCConnectionReconfigurationComplete message.
12. The UE shall send a PRACH to PSCell during T3. If the UE sends PRACH less than 115ms into T3 then count a success for the event “PRACH” otherwise count a failure for event “ADDITION”. T4 starts.
13. During T4 the UE shall send at least one CSI report for PSCell with non-zero CQI index, if so count a success for event “CSI” otherwise count a failure for event “CSI” and continue to step 16.
14. The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2 after UE has send at least one CQI report with non-zero CQI index for PSCell (Cell 2). T5 starts when the UE receives the RRC message.
15. The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5, if so count a success for event “RELEASE” otherwise count a failure for event “RELEASE”.
16. When T5 expires the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
17. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 2 = physical cell identity of Cell 1 then skip this physical cell identity value for Cell 2.
18. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
19. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “ADDITION”, “RELEASE” and “CSI” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.23.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

8.23.7.5 Test requirement

Tables 8.23.7.4.1-1 and 8.23.7.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.7.5-1: Cell specific test parameters for E-UTRAN FDD known PSCell addition and release

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					2				
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD					-				
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD					5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD					5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
PBCH_RA	dB	0					0				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
N_{oc} Note 2	dBm/15 kHz	-101+TT					N/A	-85+TT			
$\hat{E}_s/N_{oc}$	dB	19+TT	19+TT	19+TT	19+TT	19+TT	-infinity	0+TT	0+TT	0+TT	0+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	19+TT	19+TT	19+TT	19+TT	19+TT	infinity	0+TT	0+TT	0+TT	0+TT
RSRP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
SCH_RP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
Io Note 3	dBm/Ch BW	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	N/A	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN					AWGN				
Antenna Configuration		1x2					1x2				
Receive time offset to cell1 Note 4	µs	-					33				
PRACH configuration Index Note 5		4					2				

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.
Note 5: As specified in table 5.7.1-2 in TS 36.211.
Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall periodically send CSI reports for PSCell after the UE has sent first CQI report with non-zero CQI index during T4.

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in TS 36.133 Clause 7.14.2:
$T_{config\_PSCell} = 15ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

Where:

Tactivation_time = 20 ms (cell2 is known to the UE);

T_{PCell_DU} = 0 (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

T_{PSCell_DU} = 30 ms (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.8 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Asynchronous DC

Editor's note: This Test case is incomplete:

- Message content is TBD
- Test Tolerances and test system uncertainties remains

8.23.8.1 Test purpose

To verify that the PSCell addition and release delays under synchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

8.23.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of Asynchronous Dual Connectivity.

8.23.8.3 Minimum conformance requirements

Upon receiving PSCell addition in subframe *n*, the UE shall be capable to transmit PRACH preamble towards PSCell no later than in subframe $n+ T_{config\_PSCell}$:

Where:

$T_{config\_PSCell} = 20ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

$T_{activation\_time}$ is the PSCell activation delay. If the PSCell is known, then $T_{activation\_time}$ is 20ms. If the PSCell is unknown, then $T_{activation\_time}$ is 30ms provided the PSCell can be successfully detected on the first attempt.

T_{PCell_DU} is the delay uncertainty due to PCell PRACH preamble transmission. T_{PCell_DU} is up to 20ms if PSCell activation is interrupted by a PCell PRACH preamble transmission, otherwise it is 0.

T_{PSCell_DU} is the delay uncertainty in acquiring the first available PRACH occasion in the PSCell. T_{PSCell_DU} is up to 30ms.

PSCell is known if it has been meeting the following conditions:

During the last [5] seconds before the reception of the PSCell configuration command:

- the UE has sent a valid measurement report for the PSCell being configured and
- the PSCell being configured remains detectable according to the cell identification conditions specified in section 8.8,

- PSCell being configured also remains detectable during the PSCell configuration delay according to the cell identification conditions specified in section 8.8.

otherwise it is unknown. The PCell interruption specified in TS 36.133 section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell addition delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell addition procedure.

Upon receiving PSCell release in subframe *n*, the UE shall accomplish the release actions specified in [4] no later than in subframe *n*+20.

The PCell interruption specified in section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell release delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell release procedure.

The normative reference for this requirement is TS 36.133 [4] clause 7.14 and A.8.23.8.

8.23.8.4 Test description

8.23.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.8.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2..

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.8.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.8.4.3.
5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.8.4.1-1: General test parameters for known PSCell addition and release case

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Initial Condition	Active PCell		Cell1	PCell on RF channel number 1.
	Neighbour cell		Cell2	Neighbour cell on RF channel number 2.
Final Condition	Active PCell		Cell1	PCell on RF channel number 1.
	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measurement gap pattern Id			0	Gaps are configured before T2 and released before T3.
CQI/PMI periodicity and offset configuration index on cell2			0	CQI reporting for PSCell every second subframe
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of cell2.
T1		s	5	During this time the PCell shall be known and cell2 shall be unknown.
T2		s	≤ 5	During this time the UE shall identify neighbour cell (cell2) and report event A4.
T3		s	1	During this time the UE adds the PSCell.
T4		s	1	During this time the UE sends CSI reports for PSCell.
T5		s	1	During this time the UE releases the PSCell.
Note 1: Void Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in section A.3.11.				

8.23.8.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell.

The test consists of five successive time periods, with time durations of T1, T2, T3, T4 and T5, respectively.

During time duration T1, the UE shall not have any timing information of Cell 2 (Cell2 shall be unknown). Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1. Prior to the start of the time duration T2 the UE is configured with the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2) and the UE is configured with the measurement gaps (gap pattern Id # 0).

Immediately at beginning of T2 Cell2 is powered on, this shall result in reporting of Event A4 for PSCell. Immediately after receiving the reporting of event A4 the test system shall send a RRC message to the UE to release the measurement gaps. The test system shall then send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.8.4.3.
4. Set the parameters according to T1 in Table 8.23.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A4 and measurements gaps configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.8.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A4 for Cell2. After receiving the Measurement Report the test system shall send a RRC Reconfiguration message including a release of the measurement gaps. If the UE never sends a MeasurementReport triggered by Event A4 proceed to step 16.
9. The UE shall transmit an RRCConnectionReconfigurationComplete message.
10. Test system shall send a RRC Reconfiguration message to add PSCell (Cell2) on radio channel 2 and configure the UE to report periodic CSI reports for the PSCell. T3 starts when the UE receives the RRC message.
11. The UE shall transmit an RRCConnectionReconfigurationComplete message.
12. The UE shall send a PRACH to PSCell during T3. If the UE sends PRACH less than 115ms into T3 then count a success for the event “PRACH” otherwise count a failure for event “ADDITION”. T4 starts.
13. During T4 the UE shall send at least one CSI report for PSCell with non-zero CQI index, if so count a success for event “CSI” otherwise count a failure for event “CSI” and continue to step 16.
14. The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2 after UE has send at least one CQI report with non-zero CQI index for PSCell (Cell 2). T5 starts when the UE receives the RRC message.
15. The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5, if so count a success for event “RELEASE” otherwise count a failure for event “RELEASE”.
16. When T5 expires the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
17. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 2 = physical cell identity of Cell 1 then skip this physical cell identity value for Cell 2.
18. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
19. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “ADDITION”, “RELEASE” and “CSI” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.23.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

8.23.8.5 Test requirement

Tables 8.23.8.4.1-1 and 8.23.8.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.8.5-1: Cell specific test parameters for E-UTRAN FDD known PSCell addition and release

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					2				
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD					-				
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD					5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD					5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
PBCH_RA	dB	0					0				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
N_{oc} Note 2	dBm/15 kHz	-101+TT					N/A	-85+TT			
$\hat{E}_s/N_{oc}$	dB	19+TT	19+TT	19+TT	19+TT	19+TT	-infinity	0+TT	0+TT	0+TT	0+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	19+TT	19+TT	19+TT	19+TT	19+TT	infinity	0+TT	0+TT	0+TT	0+TT
RSRP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
SCH_RP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
Io Note 3	dBm/Ch BW	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	N/A	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN					AWGN				
Antenna Configuration		1x2					1x2				
Receive time offset to cell1 Note 4	µs	-					500				
PRACH configuration Index Note 5		4					2				

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Note 5: As specified in table 5.7.1-2 in TS 36.211.

Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall periodically send CSI reports for PSCell after the UE has sent first CQI report with non-zero CQI index during T4.

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in TS 36.133 Clause 7.14.2:
$T_{config\_PSCell} = 15ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

Where:

Tactivation_time = 20 ms (cell2 is known to the UE);

T_{PCell_DU} = 0 (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

T_{PSCell_DU} = 30 ms (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.9 E-UTRAN TDD Addition and Release Delay of known PSCell in Synchronous DC

Editor's note: This Test case is incomplete:

- Message content is TBD
- Test Tolerances and test system uncertainties remains

8.23.9.1 Test purpose

To verify that the PSCell addition and release delays under synchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

8.23.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of synchronous Dual Connectivity.

8.23.9.3 Minimum conformance requirements

Upon receiving PSCell addition in subframe *n*, the UE shall be capable to transmit PRACH preamble towards PSCell no later than in subframe $n+ T_{config\_PSCell}$:

Where:

$T_{config\_PSCell} = 20ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

$T_{activation\_time}$ is the PSCell activation delay. If the PSCell is known, then $T_{activation\_time}$ is 20ms. If the PSCell is unknown, then $T_{activation\_time}$ is 30ms provided the PSCell can be successfully detected on the first attempt.

T_{PCell_DU} is the delay uncertainty due to PCell PRACH preamble transmission. T_{PCell_DU} is up to 20ms if PSCell activation is interrupted by a PCell PRACH preamble transmission, otherwise it is 0.

T_{PSCell_DU} is the delay uncertainty in acquiring the first available PRACH occasion in the PSCell. T_{PSCell_DU} is up to 30ms.

PSCell is known if it has been meeting the following conditions:

During the last [5] seconds before the reception of the PSCell configuration command:

- the UE has sent a valid measurement report for the PSCell being configured and
- the PSCell being configured remains detectable according to the cell identification conditions specified in section 8.8,

- PSCell being configured also remains detectable during the PSCell configuration delay according to the cell identification conditions specified in section 8.8.

otherwise it is unknown. The PCell interruption specified in TS 36.133 section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell addition delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell addition procedure.

Upon receiving PSCell release in subframe *n*, the UE shall accomplish the release actions specified in [4] no later than in subframe *n*+20.

The PCell interruption specified in section 7.12 is allowed only during the RRC reconfiguration procedure [4].

The PSCell release delay specified in this section can be extended if SRS carrier based switching occurs during the PSCell release procedure.

The normative reference for this requirement is TS 36.133 [4] clause 7.14 and A.8.23.9.

8.23.9.4 Test description

8.23.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.9.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.9.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.9.4.1-1: General test parameters for known PSCell addition and release case

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Initial Condition	Active PCell		Cell1	PCell on RF channel number 1.
	Neighbour cell		Cell2	Neighbour cell on RF channel number 2.
Final Condition	Active PCell		Cell1	PCell on RF channel number 1.
	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measurement gap pattern Id			0	Gaps are configured before T2 and released before T3.
PRACH configuration on cell2			53	As specified in table 5.7.1-3 in TS 36.211
CQI/PMI periodicity and offset configuration index on cell2			0	CQI reporting for PSCell every uplink subframe
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of cell2.
T1		s	5	During this time the PCell shall be known and cell2 shall be unknown.
T2		s	≤ 5	During this time the UE shall identify neighbour cell (cell2) and report event A4.
T3		s	1	During this time the UE adds the PSCell.
T4		s	1	During this time the UE sends CSI reports for PSCell.
T5		s	1	During this time the UE releases the PSCell.
Note 1: Void				

8.23.9.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell.

The test consists of five successive time periods, with time durations of T1, T2, T3, T4 and T5, respectively.

During time duration T1, the UE shall not have any timing information of Cell 2 (Cell2 shall be unknown). Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1. Prior to the start of the time duration T2 the UE is configured with the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2) and the UE is configured with the measurement gaps (gap pattern Id # 0).

Immediately at beginning of T2 Cell2 is powered on, this shall result in reporting of Event A4 for PSCell. Immediately after receiving the reporting of event A4 the test system shall send a RRC message to the UE to release the measurement gaps. The test system shall then send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.9.4.3.
4. Set the parameters according to T1 in Table 8.23.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A4 and measurements gaps configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.9.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A4 for Cell2. After receiving the Measurement Report the test system shall send a RRC Reconfiguration message including a release of the measurement gaps. If the UE never sends a MeasurementReport triggered by Event A4 proceed to step 16.
9. The UE shall transmit an RRCConnectionReconfigurationComplete message.
10. Test system shall send a RRC Reconfiguration message to add PSCell (Cell2) on radio channel 2 and configure the UE to report periodic CSI reports for the PSCell. T3 starts when the UE receives the RRC message.
11. The UE shall transmit an RRCConnectionReconfigurationComplete message.
12. The UE shall send a PRACH to PSCell during T3. If the UE sends PRACH less than 115ms into T3 then count a success for the event “PRACH” otherwise count a failure for event “ADDITION”. T4 starts.
13. During T4 the UE shall send at least one CSI report for PSCell with non-zero CQI index, if so count a success for event “CSI” otherwise count a failure for event “CSI” and continue to step 16.
14. The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2 after UE has send at least one CQI report with non-zero CQI index for PSCell (Cell 2). T5 starts when the UE receives the RRC message.
15. The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5, if so count a success for event “RELEASE” otherwise count a failure for event “RELEASE”.
16. When T5 expires the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
17. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 2 = physical cell identity of Cell 1 then skip this physical cell identity value for Cell 2.
18. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
19. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “ADDITION”, “RELEASE” and “CSI” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.23.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

8.23.9.5 Test requirement

Tables 8.23.9.4.1-1 and 8.23.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.9.5-1: Cell specific test parameters for E-UTRAN TDD known PSCell addition and release

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					2				
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
Special subframe configuration Note 7		6					6				
Uplink-downlink configuration Note 7		1					1				
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD					-				
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD					5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD					5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
PBCH_RA	dB	0					0				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
N_{oc} Note 2	dBm/15 kHz	-101+TT					N/A	-85+TT			
$\hat{E}_s/N_{oc}$	dB	19+TT	19+TT	19+TT	19+TT	19+TT	-infinity	0+TT	0+TT	0+TT	0+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	19+TT	19+TT	19+TT	19+TT	19+TT	infinity	0+TT	0+TT	0+TT	0+TT
RSRP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
SCH_RP Note 3	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
Io Note 3	dBm/Ch BW	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	-54.16 +10log ($N_{RB,c}$ /50)	N/A	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)	-54.21 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN					AWGN				
Antenna Configuration		1x2					1x2				
Receive time offset to cell1 Note 4	µs	-					33				
PRACH configuration Index Note 5		56					50				

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.
Note 5: As specified in table 5.7.1-3 in TS 36.211
Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.
Note 7: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [16].

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall periodically send CSI reports for PSCell after the UE has sent first CQI report with non-zero CQI index during T4

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in TS 36.133 Clause 7.14.2:
$T_{config\_PSCell} = 15ms + T_{activation\_time} + 50ms + T_{PCell\_DU} + T_{PSCell\_DU}$

Where:

Tactivation_time = 20 ms (cell2 is known to the UE);

T_{PCell_DU} = 0 (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

T_{PSCell_DU} = 30 ms (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.24 Proximity-based Services

8.24.1 FFS

8.24.2 FFS

8.24.3 E-UTRAN FDD - Initiation/Cease of SLSS Transmission with ProSe Direct Discovery

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

8.24.3.1 Test purpose

To verify the ProSe UE's ability to initiate and cease SLSS transmissions and if the UE meets the maximum evaluation time.

8.24.3.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

8.24.3.3 Minimum conformance requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 1.96 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 1.96 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.24.3.4.1-1 in clause 8.24.3.4.1) for the parameters in this test;

SLSS period is set to 40ms.

8.24.3.4 Test description

8.24.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 Mhz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 8.24.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.24.3.4.3.
5. There is one E-UTRA FDD carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.24.3.4.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
Layer 3 filtering		Disabled	L3 filtering is not used
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
T1	s	3	
T2	s	5.24	
T3	s	5.24	

Table 8.24.3.4.1-2: ProSe Direct Communication configuration for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	UL carrier frequency
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
ProSe Direct Communication configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		Not configured	
syncTxThreshIC	dBm/15 kHz	-95	In SIB18

Table 8.24.3.4.1-3: General Test Parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
OCNG Patterns defined in A.3.2.1.2 Note 4		5MHz: OP.16 FDD 10 MHz: OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-95		
$\hat{E}_s / N_{oc}$	dB	4.5	-4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This test is according to the principle defined in section A.3.12.3.

8.24.3.4.2 Test procedure

There is one active cell (PCell) in this test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the RSRP of the PCell is above *syncTxThreshIC* and the UE is not expected to be transmitting SLSS. During T2, the RSRP of the PCell is lowered below *syncTxThreshIC* and the UE is expected to initiate SLSS transmissions. During T3, the RSRP of the PCell is increased back to be above *syncTxThreshIC* and the UE is expected to cease SLSS transmissions.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode D is activated.
2. Set the parameters according to T1 in Table 8.24.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.24.3.5-1.
4. UE is expected to initiate a SLSS transmissions inside 1.96 s from the start of T2.

5. After the SS is able to measure the SLSS in step 6) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.24.3.5-1.

6. UE is expected to cease SLSS transmission inside 1.96s from the start of T3.

7. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode 4 activated according to TS 36.508 [7] clause 4.5.4.

8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.24.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 8.24.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

8.24.3.5 Test requirement

Tables 8.24.3.4.1-1 and 8.24.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD- Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 8.24.3.5-1: Cell Specific Test requirement Parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
OCNG Patterns defined in A.3.2.1.2 Note 4		5MHz: OP.16 FDD 10 MHz: OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-95		
$\hat{E}_s / N_{oc}$	dB	4.5	-4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: This test is according to the principle defined in section A.3.12.3.

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 1.96 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 1.96 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.24.3.4.1-1 in clause 8.24.3.4.1) for the parameters in this test;

SLSS period is set to 40ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.25 E-UTRAN FDD-WLAN measurements

8.25.1 E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined.

- The Test tolerances applicable to this test are undefined.

8.25.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when doing inter-RAT (WLAN) measurements under AWGN condition within the E-UTRA FDD – WLAN measurements.

The purpose of this test is to verify that the UE correctly detects event W1 (WLAN becomes better than a threshold) for unknown cell (unknown neighbour AP) and event W3 (All WLAN inside WLAN mobility set becomes worse than a threshold) for known cell (serving AP) defined in TS 36.331 [2] within the requirements stated in clause 8.25.1.3.

8.25.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 13 and forward capable of E-UTRA FDD and LTE-WLAN Aggregation.

8.25.1.3 Minimum conformance requirements

In the RRC_CONNECTED state when no DRX is used the measurement period for WLAN RSSI shall be T_{WLAN_RSSI} as defined in Table 8.25.1.3-1.

The value of T_{WLAN_RSSI} depends upon whether the WLAN RSSI measurement is performed on the serving access point (AP) or on a neighbour AP and in case of the neighbour AP whether the neighbour AP is known or unknown to the UE:

- Measurement of known single neighbor AP is time-sensitive and is performed on the AP for which information about the operating channel is known to the UE; and

- Measurement of unknown neighbor AP is not time-sensitive and is performed on the AP for which information about the operating channel is not known to the UE.

The UE shall be capable of performing WLAN RSSI measurements for certain minimum number of APs during T_{WLAN_RSSI} as defined in Table 8.25.1.3-1 provided that the beacon frame of the measured AP is available at the UE at least once every 102.4 ms.

The UE physical layer shall be capable of reporting WLAN RSSI measurements to higher layers with the measurement period of T_{WLAN_RSSI}.

Table 8.25.1.3-1: WLAN RSSI measurement period

WLAN RSSI measurement configuration		T_{WLAN_RSSI} [seconds]
Type of Measurement	Minimum number of APs measured during T_{WLAN_RSSI}	
Measurement of serving AP	1	0.5
Measurement of known neighbor AP on a single channel	1	5
Measurement of multiple unknown neighbor APs	3	30

The WLAN RSSI measurement accuracy for all measured access points shall be fulfilled according to the accuracy as specified in sub-clause 5.1.16 of [12] shall meet the performance requirement defined in [31].

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.19 and A.8.25.1.

8.25.1.4 Test description

8.25.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 8.25.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.25.1.4.3.
5. In the tests there are two cells, cell1 (E-UTRAN FDD) and cell2 (WLAN AP). It is indicated to the UE in the measurement control information that event-triggered reporting with Events W1 (for cell2) and W3 (for cell2) are used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell2. At the beginning of T2 the transmission power of cell 2 is increased to a level, which shall result in reporting of Event W1. At the beginning of T3 the transmission power of cell 2 is decreased to a level, which shall result in reporting of Event W3.

Table 8.25.1.4.1-1: General test parameters for E-UTRAN FDD-WLAN event triggered reporting under AWGN in non-DRX

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell			Cell 2 (AP)	Cell 2 (WLAN AP) is on WLAN RF channel number 1.
CP length			Normal	Applicable to cell 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
WLAN Channel Number			1	One WLAN carrier frequency is used.
WLAN measurement quantity			WLAN RSSI	
WLAN beacon frame transmission period		ms	102.5	
DRX			OFF	
W1	Hysteresis	dB	0	Hysteresis for evaluation of event W1.
	Threshold WLAN RSSI	dBm	-70	Actual WLAN RSSI threshold for event W1. Needs to take absolute accuracy tolerance in section 9.7.1 into account plus margin.
	Time To Trigger	s	0	
W3	Hysteresis	dB	0	Hysteresis for evaluation of event W3.
	Threshold WLAN RSSI	dBm	-65	Actual WLAN RSSI threshold for event W3. Needs to take absolute accuracy tolerance in section 9.7.1 into account plus margin.
	Time To Trigger	s	0	
T1		s	5	During this time the cell1 shall be known to the UE; but cell2 shall be unknown to the UE.
T2		s	≤ 40	UE should report Event W1 for cell2 within 30 s.
T3		s	3	UE should report Event W3 for cell2 within 0.5 s.

8.25.1.4.2 Test procedure

TBDThe test scenario comprises of an E-UTRA FDD carrier and a WLAN carrier; and one cell on each carrier as given in Ttables 8.25.1.4.1-1 and 8.25.1.5-1. No gap patterns are configured in the test case. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, the SS shall use the W1 settings in table 8.25.1.4.1-1 and the UE receives an RRCConnectionReconfiguration to configure measurement for of Cell 2. Once event W1 is detected on Cell 2, the UE shall associate with the WLAN AP in Cell 2. On successful association, T3 is started and the SS shall use the W3 settings in table 8.25.1.4.1-1.1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 8.25.1.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. SS shall transmit an *RRCConnectionReconfiguration* message indicating measurement configuration of Cell 2 according to W1 in Table 8.25.1.4.1-1.

4. The start of T2 is the instant when SS shall switch the power settings of Cell 2 from T1 to T2 as specified in Table 8.25.1.5-1. T2 starts.

5. The UE shall transmit *MeasurementReport* message indicating detection of event W1 from Cell 2.

6. The SS shall transmit an *RRCConnectionReconfiguration* including Cell 2 in *wlanToAddList*. On successful association with Cell 2, the UE shall send a *WLANConnectionStatusReport* with WLAN-Status-r13 set to *successfulAssociation* before T-351 expiry.

7. SS shall transmit an *RRCConnectionReconfiguration* message indicating measurement configuration of Cell 2 according to W3 in Table 8.25.1.4.1-1.

8. The start of T3 is the instant when SS shall switch the power settings of Cell 2 from T2 to T3 as specified in Table 8.25.1.5-1. T3 starts.

9. The UE shall transmit *MeasurementReport* message indicating detection of event W3 from Cell 2.

10. The SS shall transmit an *RRCConnectionReconfiguration* including Cell 2 in *wlanToReleaseList*. On successful disassociation with Cell 2, the UE shall send a *RRCConnectionReconfigurationComplete*.

8.25.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.25.1.4.3-1: *RRCConnectionReconfiguration* (step 3 and 7 of 8.25.1.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition MEAS

Table 8.25.1.4.3-2: *MeasConfig* (step 3, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
measConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	1		
measObject[1]	MeasObjectWLAN-GENERIC(Freq, SSID)	See Table 8.25.1.4.3-3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	1		
reportConfig[1]	ReportConfigInterRAT-W1-WLAN(-70)	Note: Set as per W1 setting for WLAN RSSI Table 8.25.1.4.1-1.	
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	1		
reportConfigId[1]	1	IdReportConfig-W1	
}			
}			

Table 8.25.1.4.3-3: MeasObjectWLAN-GENERIC (step 3, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-3AA			
Information Element	**Value/Remark**	**Comment**	**Condition**
measObjectWLAN-r13 SEQUENCE {			
carrierFreq-r13	Same as used for Cell 2	Band and Carrier information	
wlan-ToAddModList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of TS 36.508 [7]		
ssid-r12[2]	Not Present		
}			
wlan-ToRemoveList-r13	Not Present		
}			

Table 8.25.1.4.3-4: ReportConfigInterRAT-W1-WLAN (step 3, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-9A			
Information Element	**Value/Remark**	**Comment**	**Condition**
ReportConfigInterRAT-W1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {	1 entry		
eventID CHOICE {			
eventW1-r13 SEQUENCE {	1 entry		
w1-Threshold-r13	31	ThreshDB+101=31 where ThreshDB = -70dBm. Note: Set as per W1 setting for WLAN RSSI Table 8.25.1.4.1-1.	
}			
hysteresis	0		
timeToTrigger	0		
}			
}			
}			
}			

Table 8.25.1.4.3-5: *RRCConnectionReconfiguration* (step 6, 8.25.1.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition LWA			
Information Element	**Value/Remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	Not Present		
mobilityControlInfo	Not Present		
dedicatedInfoNASList	Not Present		
radioResourceConfigDedicated	Not Present		
securityConfigHO	Not Present		
nonCriticalExtension{		v890	
nonCriticalExtension{		v920	
nonCriticalExtension{		v1020	
nonCriticalExtension{		v1130	
nonCriticalExtension{		v1250	
nonCriticalExtension{		v1310	
Lwa-configuration-r13	LWA-Configuration-GENERIC(SSID) Set as per Table 8.25.1.4.3-6	SSID set as per Table 4.4.8-1 of 36.508 [7]	
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.25.1.4.3-6: *LWA-Configuration-GENERIC* (step 6, 8.25.1.4.2)

Derivation Path: 36.508 [7] clause 4.6.3 table 4.6.3-34 with condition ADD, SUCCESS			
Information Element	**Value/Remark**	**Comment**	**Condition**
LWA-Configuration-r13 CHOICE {			
setup SEQUENCE {			
lwa-MobilityConfig-r13 SEQUENCE {			
wlan-ToReleaseList-r13	Not Present		
wlan-ToAddList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
bssid-r12	Not Present		
hessid-r12	Not Present		
}			
associationTimer-r13	s10		
successReportRequested-r13	true		
}			
lwa-WT-Counter-r13	1		
}			
}			

Table 8.25.1.4.3-7: *MeasConfig* (step 7, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
measConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	1		
measObject[1]	MeasObjectWLAN-GENERIC(Freq, SSID)	See Table 8.25.1.4.3-8	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	1		
reportConfig[1]	ReportConfigInterRAT-W3-WLAN(-65)	See Table 8.25.1.4.3-9	
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	1		
reportConfigId[1]	1		
}			
}			

Table 8.25.1.4.3-8: MeasObjectWLAN-GENERIC (step 7, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-3AA			
Information Element	**Value/Remark**	**Comment**	**Condition**
measObjectWLAN-r13 SEQUENCE {			
carrierFreq-r13	Same as used for Cell 2	Band and Carrier information	
wlan-ToAddModList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
}			
wlan-ToRemoveList-r13	Not Present		
}			

Table 8.25.1.4.3-9: ReportConfigInterRAT-W3-WLAN (step 7, 8.25.1.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-9C			
Information Element	**Value/Remark**	**Comment**	**Condition**
ReportConfigInterRAT-W3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {	1 entry		
eventID CHOICE {			
eventW3-r13 SEQUENCE {	1 entry		
W3-Threshold-r13	36	ThreshDB+101=36 where ThreshDB = -65dBm. Note: Set as per W3 setting for WLAN RSSI in Table 8.25.1.4.1-1.	
}			
hysteresis	0		
timeToTrigger	0		
}			
}			
}			
}			

Table 8.25.1.4.3-10: *RRCConnectionReconfiguration* (step 10, 8.25.1.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition LWA			
Information Element	**Value/Remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	Not Present		
mobilityControlInfo	Not Present		
dedicatedInfoNASList	Not Present		
radioResourceConfigDedicated	Not Present		
securityConfigHO	Not Present		
nonCriticalExtension{		v890	
nonCriticalExtension{		v920	
nonCriticalExtension{		v1020	
nonCriticalExtension{		v1130	
nonCriticalExtension{		v1250	
nonCriticalExtension{		v1310	
Lwa-configuration-r13	LWA-Configuration-GENERIC(SSID) Set as per Table 8.25.1.4.3-11	SSID set as per Table 4.4.8-1 of 36.508 [7]	
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.25.1.4.3-11: *LWA-Configuration-GENERIC* (step 10, 8.25.1.4.2)

Derivation Path: 36.508 [7] clause 4.6.3 table 4.6.3-34 with condition RELEASE			
Information Element	**Value/Remark**	**Comment**	**Condition**
LWA-Configuration-r13 CHOICE {			
setup SEQUENCE {			
lwa-MobilityConfig-r13 SEQUENCE {			
wlan-ToReleaseList-r13	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
bssid-r12	Not Present		
hessid-r12	Not Present		
}			
wlan-ToAddList-r13	Not Present		
associationTimer-r13	Not Present		
successReportRequested-r13	Not Present		
}			
lwa-WT-Counter-r13	1		
}			
}			

8.25.1.5 Test requirement

Table 8.25.1.4.1-1 and Table 8.25.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN.

Table 8.25.1.5-1: Cell specific test parameters for E-UTRAN FDD-WLAN event triggered reporting under AWGN in non-DRX

Parameter	Unit	Cell 1			Cell 2 (WLAN AP)		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			N/A		
WLAN RF channel Number		N/A			1		
$BW_{channel}$		10MHz			20 MHz		
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD			N/A		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD			N/A		
OCNG Patterns		OP.1 FDD			N/A		
PBCH_RA	dB	0			N/A		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc1} Note 2	dBm/15 KHz	-98			N/A		
N_{oc2} Note 3	dBm/20 MHz	N/A			-75		
$\hat{E}_s/N_{oc1}$	dB	3	3	3	N/A		
$\hat{E}_s/I_{ot}$ Note 4	dB	3	3	3			
RSRP Note 4	dBm/15 kHz	-95	-95	-95			
SCH_RP Note 4	dBm/15 kHz	-95	-95	-95			
Io Note 3	dBm/Ch BW	-65.5	-65.5	-65.5			
WLAN RSSI Note 4	dBm/20 MHz				-infinity	-65	-70
WLAN SNR	dB				-infinity	9.54	3.35
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			-		
Timing offset to Cell 1	ms	0			3		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over the bandwidth and time and shall be modelled as AWGN of appropriate power for N_{oc2} to be fulfilled.

Note 4: Es/Iot, RSRP, SCH_RP, Io and WLAN RSSI have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event W1 triggered measurement report, with a measurement reporting delay less than 30 seconds from the beginning of time period T2.

The UE shall send one Event W3 triggered measurement report, with a measurement reporting delay less than 500 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.25.2 E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined.

- The Test tolerances applicable to this test are undefined in Table 8.25.2.5-1.

8.25.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when doing inter-RAT (WLAN) measurements under AWGN condition within the E-UTRA TDD – WLAN measurements.

The purpose of this test is to verify that the UE correctly detects event W1 (WLAN becomes better than a threshold) for unknown cell (unknown neighbour AP) and event W3 (All WLAN inside WLAN mobility set becomes worse than a threshold) for known cell (serving AP) defined in TS 36.331 [2] within the requirements stated in clause 8.25.2.3.

8.25.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 13 and forward capable of E-UTRA TDD and LTE-WLAN Aggregation. Applicability requires support for FGI bits TBD.

8.25.2.3 Minimum conformance requirements

In the RRC_CONNECTED state when no DRX is used the measurement period for WLAN RSSI shall be T_{WLAN_RSSI} as defined in Table 8.25.2.3-1.

The value of T_{WLAN_RSSI} depends upon whether the WLAN RSSI measurement is performed on the serving access point (AP) or on a neighbour AP and in case of the neighbour AP whether the neighbour AP is known or unknown to the UE:

- Measurement of known single neighbour AP is time-sensitive and is performed on the AP for which information about the operating channel is known to the UE; and

- Measurement of unknown neighbour AP is not time-sensitive and is performed on the AP for which information about the operating channel is not known to the UE.

The UE shall be capable of performing WLAN RSSI measurements for certain minimum number of APs during T_{WLAN_RSSI} as defined in Table 8.25.2.3-1 provided that the beacon frame of the measured AP is available at the UE at least once every 102.4 ms. The UE physical layer shall be capable of reporting WLAN RSSI measurements to higher layers with the measurement period of T_{WLAN_RSSI}.

Table 8.25.2.3-1: WLAN RSSI measurement period

WLAN RSSI measurement configuration		T_{WLAN_RSSI} [seconds]
Type of Measurement	**Minimum number of APs measured during T_{WLAN_RSSI}**	
Measurement of serving AP	1	0.5
Measurement of known neighbor AP on a single channel	1	5
Measurement of multiple unknown neighbor APs	3	30

The WLAN RSSI measurement accuracy for all measured access points shall be fulfilled according to the accuracy as specified in sub-clause 5.1.16 of [31] shall meet the performance requirement defined in [32].

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.20 and A.8.25.2.

8.25.2.4 Test description

8.25.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 8.25.2.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.25.2.4.3.
5. In the tests there are two cells, cell1 (E-UTRAN TDD) and cell2 (WLAN AP). It is indicated to the UE in the measurement control information that event-triggered reporting with Events W1 (for cell2) and W3 (for cell2) are used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell2. At the beginning of T2 the transmission power of cell 2 is increased to a level, which shall result in reporting of Event W1. At the beginning of T3 the transmission power of cell 2 is decreased to a level, which shall result in reporting of Event W3.

Table 8.25.2.4.1-1: General test parameters for E-UTRAN TDD-WLAN event triggered reporting under AWGN in non-DRX

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell			Cell 2 (AP)	Cell 2 (WLAN AP) is on WLAN RF channel number 1.
CP length			Normal	Applicable to cell 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
WLAN Channel Number			1	One WLAN carrier frequency is used.
WLAN measurement quantity			WLAN RSSI	
WLAN beacon frame transmission period		ms	102.5	
DRX			OFF	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [16]. The same configuration applies to all cells.
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [16]. The same configuration applies to all cells
W1	Hysteresis	dB	0	Hysteresis for evaluation of event W1.
	Threshold WLAN RSSI	dBm	-70	Actual WLAN RSSI threshold for event W1. Needs to take absolute accuracy tolerance in section 9.7.1 into account plus margin.
	Time To Trigger	s	0	
W3	Hysteresis	dB	0	Hysteresis for evaluation of event W3.
	Threshold WLAN RSSI	dBm	-65	Actual WLAN RSSI threshold for event W3. Needs to take absolute accuracy tolerance in section 9.7.1 into account plus margin.
	Time To Trigger	s	0	
T1		s	5	During this time the cell1 shall be known to the UE; but cell2 shall be unknown to the UE.
T2		s	≤ 40	UE should report Event W1 for cell2 within 30 s.
T3		s	3	UE should report Event W3 for cell2 within 0.5 s.

8.25.2.4.2 Test procedure

The test scenario comprises of an E-UTRA TDD carrier and a WLAN carrier; and one cell on each carrier as given in Tables 8.25.2.4.1-1 and 8.25.2.5-1. No gap patterns are configured in the test case. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, the SS shall use the W1 settings in table 8.25.2.4.1-1 and the UE receives an *RRCConnectionReconfiguration* to

configure measurement for of Cell 2. Once event W1 is detected on Cell 2, the UE shall associate with the WLAN AP in Cell 2. On successful association, T3 is started and the SS shall use the W3 settings in table 8.25.2.4.1-1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 8.25.2.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. SS shall transmit an *RRCConnectionReconfiguration* message indicating measurement configuration of Cell 2 according to W1 in Table 8.25.2.4.1-1.
4. The start of T2 is the instant when SS shall switch the power settings of Cell 2 from T1 to T2 as specified in Table 8.25.2.5-1. T2 starts.
5. The UE shall transmit *MeasurementReport* message indicating detection of event W1 from Cell 2.
6. The SS shall transmit an *RRCConnectionReconfiguration* including Cell 2 in *wlanToAddList*. On successful association with Cell 2, the UE shall send a *WLANConnectionStatusReport* with WLAN-Status-r13 set to *successfulAssociation* before T-351 expiry.
7. SS shall transmit an *RRCConnectionReconfiguration* message indicating measurement configuration of Cell 2 according to W3 in Table 8.25.2.4.1-1.
8. The start of T3 is the instant when SS shall switch the power settings of Cell 2 from T2 to T3 as specified in Table 8.25.2.5-1. T3 starts.
9. The UE shall transmit *MeasurementReport* message indicating detection of event W3 from Cell 2.
10. The SS shall transmit an *RRCConnectionReconfiguration* including Cell 2 in *wlanToReleaseList*. On successful disassociation with Cell 2, the UE shall send a *RRCConnectionReconfigurationComplete*.

8.25.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.25.2.4.3-1: *RRCConnectionReconfiguration* (step 3 and 7 of 8.25.2.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition MEAS

Table 8.25.2.4.3-2: *MeasConfig* (step 3, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
measConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	1		
measObject[1]	MeasObjectWLAN-GENERIC(Freq, SSID)	See Table 8.25.2.4.3-3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	1		
reportConfig[1]	ReportConfigInterRAT-W1-WLAN(-70)	Note: Set as per W1 setting for WLAN RSSI Table 8.25.2.4.1-1.	
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	1		
reportConfigId[1]	1	IdReportConfig-W1	
}			
}			

Table 8.25.2.4.3-3: MeasObjectWLAN-GENERIC (step 3, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-3AA			
Information Element	**Value/Remark**	**Comment**	**Condition**
measObjectWLAN-r13 SEQUENCE {			
carrierFreq-r13	Same as used for Cell 2	Band and Carrier information	
wlan-ToAddModList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
ssid-r12[2]	Not Present		
}			
wlan-ToRemoveList-r13	Not Present		
}			

Table 8.25.2.4.3-4: ReportConfigInterRAT-W1-WLAN (step 3, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-9A			
Information Element	**Value/Remark**	**Comment**	**Condition**
ReportConfigInterRAT-W1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {	1 entry		
eventID CHOICE {			
eventW1-r13 SEQUENCE {	1 entry		
w1-Threshold-r13	31	ThreshDB+101=31 where ThreshDB = -70dBm. Note: Set as per W1 setting for WLAN RSSI Table 8.25.2.4.1-1.	
}			
hysteresis	0		
timeToTrigger	0		
}			
}			
}			
}			

Table 8.25.2.4.3-5: *RRCConnectionReconfiguration* (step 6, 8.25.2.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition LWA			
Information Element	**Value/Remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	Not Present		
mobilityControlInfo	Not Present		
dedicatedInfoNASList	Not Present		
radioResourceConfigDedicated	Not Present		
securityConfigHO	Not Present		
nonCriticalExtension{		v890	
nonCriticalExtension{		v920	
nonCriticalExtension{		v1020	
nonCriticalExtension{		v1130	
nonCriticalExtension{		v1250	
nonCriticalExtension{		v1310	
Lwa-configuration-r13	LWA-Configuration-GENERIC(SSID) Set as per Table 8.25.2.4.3-6	SSID set as per Table 4.4.8-1 of 36.508 [7]	
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.25.2.4.3-6: *LWA-Configuration-GENERIC* (step 6, 8.25.2.4.2)

Derivation Path: 36.508 [7] clause 4.6.3 table 4.6.3-34 with condition ADD, SUCCESS			
Information Element	**Value/Remark**	**Comment**	**Condition**
LWA-Configuration-r13 CHOICE {			
setup SEQUENCE {			
lwa-MobilityConfig-r13 SEQUENCE {			
wlan-ToReleaseList-r13	Not Present		
wlan-ToAddList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
bssid-r12	Not Present		
hessid-r12	Not Present		
}			
associationTimer-r13	s10		
successReportRequested-r13	true		
}			
lwa-WT-Counter-r13	1		
}			
}			

Table 8.25.2.4.3-7: *MeasConfig* (step 7, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
measConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId[1]	1		
measObject[1]	MeasObjectWLAN-GENERIC(Freq, SSID)	See Table 8.25.2.4.3-8	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	1		
reportConfig[1]	ReportConfigInterRAT-W3-WLAN(-65)	See Table 8.25.2.4.3-9	
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	1		
reportConfigId[1]	1		
}			
}			

Table 8.25.2.4.3-8: MeasObjectWLAN-GENERIC (step 7, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-3AA			
Information Element	**Value/Remark**	**Comment**	**Condition**
measObjectWLAN-r13 SEQUENCE {			
carrierFreq-r13	Same as used for Cell 2	Band and Carrier information	
wlan-ToAddModList-r13 OF SEQUENCE {	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
}			
wlan-ToRemoveList-r13	Not Present		
}			

Table 8.25.2.4.3-9: ReportConfigInterRAT-W3-WLAN (step 7, 8.25.2.4.2)

Derivation path: 36.508 [7] clause 4.6.6 table 4.6.6-9C			
Information Element	**Value/Remark**	**Comment**	**Condition**
ReportConfigInterRAT-W3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {	1 entry		
eventID CHOICE {			
eventW3-r13 SEQUENCE {	1 entry		
W3-Threshold-r13	36	ThreshDB+101=36 where ThreshDB = -65dBm. Note: Set as per W3 setting for WLAN RSSI in Table 8.25.2.4.1-1.	
}			
hysteresis	0		
timeToTrigger	0		
}			
}			
}			
}			

Table 8.25.2.4.3-10: *RRCConnectionReconfiguration* (step 10, 8.25.2.4.2)

Derivation Path: 36.508 [7] clause 4.6.1 table 4.6.1-8 with condition LWA			
Information Element	**Value/Remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	Not Present		
mobilityControlInfo	Not Present		
dedicatedInfoNASList	Not Present		
radioResourceConfigDedicated	Not Present		
securityConfigHO	Not Present		
nonCriticalExtension{		v890	
nonCriticalExtension{		v920	
nonCriticalExtension{		v1020	
nonCriticalExtension{		v1130	
nonCriticalExtension{		v1250	
nonCriticalExtension{		v1310	
Lwa-configuration-r13	LWA-Configuration-GENERIC(SSID) Set as per Table 8.25.2.4.3-11	SSID set as per Table 4.4.8-1 of 36.508 [7]	
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.25.2.4.3-11: *LWA-Configuration-GENERIC* (step 10, 8.25.2.4.2)

Derivation Path: 36.508 [7] clause 4.6.3 table 4.6.3-34 with condition RELEASE			
Information Element	**Value/Remark**	**Comment**	**Condition**
LWA-Configuration-r13 CHOICE {			
setup SEQUENCE {			
lwa-MobilityConfig-r13 SEQUENCE {			
wlan-ToReleaseList-r13	1 entry		
ssid-r12[1]	Set as per Table 4.4.8-1 of 36.508 [7]		
bssid-r12	Not Present		
hessid-r12	Not Present		
}			
wlan-ToAddList-r13	Not Present		
associationTimer-r13	Not Present		
successReportRequested-r13	Not Present		
}			
lwa-WT-Counter-r13	1		
}			
}			

8.25.2.5 Test requirement

Table 8.25.2.4.1-1 and Table 8.25.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN.

Table 8.25.2.5-1: Cell specific test parameters for E-UTRAN TDD-WLAN event triggered reporting under AWGN in non-DRX

Parameter	Unit	Cell 1			Cell 2 (WLAN AP)		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			N/A		
WLAN RF channel Number		N/A			1		
$BW_{channel}$		10MHz			20 MHz		
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD			N/A		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD			N/A		
OCNG Patterns		OP.1 TDD			N/A		
PBCH_RA	dB	0			N/A		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc1} Note 2	dBm/15 KHz	-98			N/A		
N_{oc2} Note 3	dBm/20 MHz	N/A			-75		
$\hat{E}_s/N_{oc1}$	dB	3	3	3	N/A		
$\hat{E}_s/I_{ot}$ Note 4	dB	3	3	3			
RSRP Note 4	dBm/15 kHz	-95	-95	-95			
SCH_RP Note 4	dBm/15 kHz	-95	-95	-95			
Io Note 3	dBm/Ch BW	-65.5	-65.5	-65.5			
WLAN RSSI Note 4	dBm/20 MHz	N/A	N/A	N/A	-infinity	-65	-70
WLAN SNR	dB	N/A	N/A	N/A	-infinity	9.54	3.35
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			-		
Timing offset to Cell 1	ms	0			3		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc1} to be fulfilled.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over the bandwidth and time and shall be modelled as AWGN of appropriate power for N_{oc2} to be fulfilled.

Note 4: Es/Iot, RSRP, SCH_RP, Io and WLAN RSSI have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The UE shall send one Event W1 triggered measurement report, with a measurement reporting delay less than 30 seconds from the beginning of time period T2.

The UE shall send one Event W3 triggered measurement report, with a measurement reporting delay less than 500 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26 Frame Structure 3 (FS3)

8.26.1 E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell with FDD PCell in non-DRX

8.26.1.1 Test purpose

To verify that the LAA SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.26.1.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support LAA. Applicability requires support of FGI bit 25.

8.26.1.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated LAA SCell depends upon the specified conditions.

The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and one SCell following the frame structure type 3 [9].

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [11] for the SCell being activated no later than in subframe $n+T_{activate\_basic\_FS3}$, provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
  - the UE has sent a valid measurement report for the SCell being activated and
  - the SCell being activated remains detectable according to the cell identification conditions specified in section 8.3.3.2 of [4],
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section 8.3.3.2 of [4].

$T_{activate\_basic\_FS3}$ = 16 ms + $T_{DMTC\_duration}$ + (*L*+2) * $T_{DMTC\_periodicity}$, where

$T_{DMTC\_duration}$ =6 ms is the DMTC duration [5],

$T_{DMTC\_periodicity}$ is the periodicity of the DMTC [5],

L is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit a valid CSI report and apply actions related to the activation command as specified in [11] for the SCell being activated no later than in subframe $n+T_{activate\_basic\_FS3}$, provided the SCell can be successfully detected on the first attempt. In this case, Tactivate_basic_FS3 is defined as follows.

$T_{activate\_basic\_FS3}$ = 16 ms + $T_{DMTC\_duration}$ + (L+3) * $T_{DMTC\_periodicity}$, where

$T_{DMTC\_duration}$ = 6 ms is the DMTC duration [5],

$T_{DMTC\_periodicity}$ is the periodicity of the DMTC [5],

L is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe $n+ T_{activate\_basic\_FS3}$ then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [8] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 of [4] are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [8] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [17] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in section 7.8.2 of [4] shall not occur before subframe n+5 and not occur after subframe *n+9* when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 of [4] shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

Starting from the subframe specified in Section 4.3 of [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE has available uplink resources to report for the SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe n+5 and not occur after subframe *n*+9 when PCell belongs to E-UTRA FDD.

The PCell interruption specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7.10 and A.8.26.1.

8.26.1.4 Test description

8.26.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. The general test parameter settings are set up according to Table 8.26.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.1.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is LAA SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.26.1.4.1-1: General test parameters for known LAA SCell activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated LAA FS3 SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
SCell measurement cycle (measCycleSCell)	ms	320	
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset		10	As specified in IE MeasDS-Config in TS 36.331
laa-SCellSubframeConfig		00000000	No MBSFN subframe.
T1	s	7	During this time the PCell shall be known and the SCell configured and detected.
T2	s	> $T_{activate\_basic\_FS3}$	During this time the UE shall activate the SCell, $T_{activate\_basic\_FS3}$ is specified in section 7.7.10.
T3	s	1	During this time the UE shall deactivate the SCell.

8.26.1.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. Before the test starts the UE is connected to Cell1 on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. Cell 1 has constant signal levels throughout the test, and Cell 2 transmits discovery signal with LBT model.The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.26.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

4. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.1.4.3.

5. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

6. The SS activates SCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 10.

7. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation.

   - If the first CSI report for SCell is received by the SS in a subframe (m+8),

- or (m+10) if the subframe (m+8) was subject to interruption,

- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+ $T_{activate\_basic\_FS3}$),

  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+ $T_{activate\_basic\_FS3}$)

- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) up to the end of T2,

- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13) up to the end of T2,

- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 10.

8. When T2 expires, the SS deactivate SCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 9, otherwise go to step 10.

9. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and ≤2 inconsecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) up to the end of T3

   - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

10. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 7, or Deactivation in step 8 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.26.1.4.3 Message contents

Table 8.26.1.4.3-1: Common Exception messages for E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3

Table 8.26.1.4.3-2: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2
}			

Table 8.26.1.4.3-3: *SystemInformationBlockType2*: Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.26.1.4.3-4: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2
}			

Table 8.26.1.4.3-5: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
Laa-ScellConfiguration-r13 SEQUENCE {			
subframeStartPosition	's0'		
Laa-SCellSubframeConfig	'00000000'	No MBSFN subframes configured	
}			
}			

Table 8.26.1.4.3-6: MeasDS-Config-DEFAULT*:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: 36.508 clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			

Table 8.26.1.4.3-7: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_Add Mod
}			

Table 8.26.1.4.3-8: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.26.1.4.3-9: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.26.1.4.3-10: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.26.1.4.3-11: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

8.26.1.5 Test requirement

Table 8.26.1.4.1-1 and Table 8.26.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known LAA SCell in non-DRX test.

Table 8.26.1.5-1: Cell specific test parameters for E-UTRAN FDD known LAA SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			20		
LBT model		-			C.3.5		
PDSCH parameters defined in A. 1.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			-		
OCNG Patterns defined in A. 1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			OP.14 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note3	dBm/Ch BW	-59.1+10log($N_{RB,c}$ /50)			-56.1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
timing offset to cell1	μs	-			0		
Time alignment error relative to cell 1 Note 5	μs	-			≤ TAE		

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+ $T_{activate\_basic\_FS3}$)ms, *L* is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

Figures 8.26.1.5-1 and 8.26.1.5-2 show the deriviation of the Test procedure requreiment for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

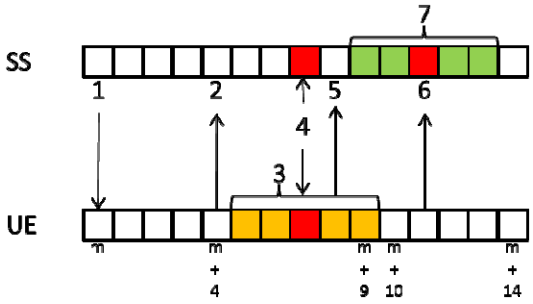

Figure 8.26.1.5-2: Procedure derivation for Activation

1) Activation command for SCell
2) ACK for MAC-CE for SCell activation
3) Possible interruption period by SCell activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell activation,

   That is, possible DTX timing on SS
5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell activation
7) Possible DTX reception period on SS due to interruption by SCell1 activation

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.26.2 E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell with TDD PCell in non-DRX

8.26.2.1 Test purpose

To verify that the LAA SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.26.2.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 13 and forward that support LAA. Applicability requires support for IE laa-Parameters-r13. Applicability requires support of FGI bit 25.

8.26.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.26.1.3.

8.26.2.4 Test description

8.26.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.2.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
2. The general test parameter settings are set up according to Table 8.26.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.26.2.4.3.
5. Cell1 is PCell on the primary component carrier and Cell 2 is LAA SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.26.2.4.1-1: General test parameters for known LAA SCell activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated LAA FS3 SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
SCell measurement cycle (measCycleSCell)	ms	320	
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset		10	As specified in IE MeasDS-Config in TS 36.331
laa-SCellSubframeConfig		00000000	No MBSFN subframe.
T1	s	7	During this time the PCell shall be known and the SCell configured and detected.
T2	s	> $T_{activate\_basic\_FS3}$	During this time the UE shall activate the SCell
T3	s	1	During this time the UE shall deactivate the SCell.

8.26.2.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. Before the test starts the UE is connected to Cell1 on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only

monitoring the PCC. Cell 1 has constant signal levels throughout the test, and Cell 2 transmits discovery signal with LBT model. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption. The SS determines whether the CSI report was interrupted or not by monitoring ACK/NACK sent in PCell at the same time as the first CSI report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.26.2.4.1-1. Propagation conditions are set according to Annex B clauses B.0. T1 starts.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.2.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. The SS activates SCell by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.
6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.
    - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
        - or (m+9) if the subframe (m+8) was subject to interruption
    - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+ $T_{activate\_basic\_FS3}$),
        - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+ $T_{activate\_basic\_FS3}$)
    - and DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS anywhere outside the subframes (m+5), (m+9) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+6), (m+13) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+7), (m+13) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframe (m+8) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframe (m+9) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+10), (m+14) up to the end of T2,
    - or DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (m+11), (m+18) up to the end of T2,
    - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 9.
7. When T2 expires, the SS deactivate SCell by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.
8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS anywhere outside the subframes (n+5), (n+9) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+6), (n+13) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+7), (n+13) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+8) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+9) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+10), (n+14) up to the end of T3,
- or either DTX or “NACK/DTX” (defined in TS 36.213 clause 10.1) are not observed by the SS outside the subframes (n+11), (n+18) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6, or Deactivation in step 7 was not acknowledged, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.26.2.4.3 Message contents

Same message contents as in clause 8.26.1.4.3.

8.26.2.5 Test requirement

Table 8.26.2.4.1-1 and Table 8.26.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known LAA SCell in non-DRX test.

Table 8.26.2.5-1: Cell specific test parameters for E-UTRAN TDD known LAA SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			20		
Uplink-downlink configuration[Note1]		1			-		
Special subframe configuration[Note2]		6			-		
LBT model		-			C.3.5		
PDSCH parameters defined in A.1.2		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-		
PCFICH/PDCCH/PHICH parameters defined in A.2.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			-		
OCNG Patterns defined in D.1 and D.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			OP.14 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 1]	dB						
OCNG_RB[Note 1]	dB						
N_{oc}[Note 4]	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
RSRP [Note 5]	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$ [Note 5]	dB	17			17		
SCH_RP [Note 5]	dBm/15 kHz	-87			-87		
Io [Note 5]	dBm/Ch BW	-59.1+10log($N_{RB,c}$ /50)			-56.1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x2			1x2		
timing offset to cell1	μs	-			0		
Time alignment error relative to cell 1 [Note 7]	μs	-			≤ TAE		

Note 1: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 2: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 3: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.
Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 5: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1.

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether first CSI report was interrupted or not is checked by monitoring ACK/NACK sent in PCell at the same time as the first CSI report.

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+ $T_{activate\_basic\_FS3}$)ms, *L* is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (m+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+11).

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+11).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+ $T_{activate\_basic\_FS3}$)ms, *L* is the number of times the discovery signal occasion is not available at the UE during the SCell activation time, then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.26.3 E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX

8.26.3.1 Test purpose

To verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.12.2.4 while at the same time fulfilling the requirement on interruption rate.

8.26.3.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support LAA for only one Scell. Applicability requires support of FGI bit 111.

8.26.3.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable cell on a secondary component carrier within the cell identification time $T_{identify\_SCC\_FS3}$, where the cell identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_SCC\_FS3\_CRS}$.

$T_{identify\_SCC\_FS3}$ is the time period for cell identification as specified in Table 8.26.3.3-1,

$T_{measure\_SCC\_FS3\_CRS}$ is the time period for measurements as shown in Table 8.26.3.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_SCC\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_SCC\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell.

The requirements in this section apply, provided that L and M are such that: the cell identification period $T_{identify\_SCC\_FS3}$ does not exceed 75**measCycleSCell*, and the time period $T_{measure\_SCC\_FS3\_CRS}$ for measurements does not exceed 60**measCycleSCell*.

Table 8.26.3.3-1: Cell identification with deactivated SCell on SCC under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_SCC\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	*(7+L)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		*(25+L)*k1*k2*measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	*(3+L)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		*(9+L)*k1*k2*measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.
Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_SCC\_FS3}$:

- RSRP related side condition given in TS 36.133 Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.3.3-1.

The measurement period for deactivated SCell measurements is $T_{measure\_SCC\_FS3\_CRS}$ according to the parameter *measCycleSCell* shown in Table 8.26.3.3-2.

Table 8.26.3.3-2: Measurement requirements on SCC with deactivated SCell under operation with frame structure 3 with deactivated SCell

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_SCC\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	*(5+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		*(20+M)*k1*k2*measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	*(1+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		*(4+M)*k1*k2*measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.

Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

The UE shall be capable of performing RSRP and RSRQ measurements for 2 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_SCC\_FS3\_CRS}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.19.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one SCC with deactivated SCell. This may cause interruptions on PCell that are specified in TS 36.133 Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_SCC\_FS3}$ defined in TS 36.133 Section 8.12.2.4.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_SCC\_FS3}$ defined in TS 36.133 Section 8.12.2.4.1 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_SCC\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.12.2.4 and A.8.26.3.

8.26.3.4 Test description

8.26.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.3.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.26.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.3.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.3.4.1-1: General test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2 for frame structure 3.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2 for frame structure 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.18.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331
Filter coefficient			0	L3 filtering is not used
LBT modelling			Cell2 and Cell3	Applied for cell2 and cell3 as specified in C.3.5, yet discovery reference signal is transmitted during each DMTC window with probability P = 1.
SCell measurement cycle		ms	160	*measCycleSCell* as specified in TS 36.331
DMTC period		ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
subframeStartPosition			s0	Discovery signal starts from subframe #0
laa-SCellSubframeConfig			00000000	No MBSFN subframe.
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤5+ L* measCycleSCell	UE should report Event A6 within 4s (20×scellMeasCycle)

8.26.3.4.2 Test procedure

In the test there are three synchronous cells: Cell1, Cell2 and Cell3. Cell1 is PCell on the FDD primary component (RF Channel 1), Cell2 is deactivated SCell on the secondary component (RF Channel 2) for frame structure 3, and Cell3 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3. Cell 2 and Cell 3 transmit

discovery signal with LBT model. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. PCell is indicated by the network using IE allowInterruptions and PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/ NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.3.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.3.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 4002 + L* measCycleSCell ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.3.4.3 Message contents

Table 8.26.3.4.3-1: E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.26.3.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.26.3.4.3-3: *MeasConfig:* Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
}			
}			
allowInterruptions-r11	TRUE	Cell 1	

Table 8.26.3.4.3-4: MeasObjectEUTRA-GENERIC(f2): E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	Sf160		
}			

Table 8.26.3.4.3-5: Void

Table 8.26.3.4.3-6: *MeasurementReport*: Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.26.3.4.3-7: Void

Table 8.26.3.4.3-8: MeasDS-Config-DEFAULT*:* Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			

8.26.3.5 Test requirement

Table 8.26.3.4.1-1 and Table 8.26.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.26.3.5-1: Cell specific test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		20		20	
PDSCH parameters defined in A.1.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		-		-	
PCFICH/PDCCH/PHICH parameters defined in A.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		-		-	
OCNG Patterns defined in A. 1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		OP.14 FDD		OP.14 FDD	
IE allowInterruptions		True		-		-	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$\hat{E}_s / N_{oc}$	dB	13	13	9.9	9.9	-Infinity	9.9
RSRP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-Infinity	-88.1
$\hat{E}_s / I_{ot}$ Note 4	dB	13	13	9.9	-0.42	-Infinity	-0.42
SCH_RP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-Infinity	-88.1
Io Note4	dBm/Ch BW	-57.01+10log($N_{RB,c}$ /50)		-56.89+ 10log ($N_{RB,c}$ /50)	-54.08+ 10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2	
timing offset to cell1	µs	-		0		0	
timing offset to cell2	µs			-		0	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		≤ TAE	
Time alignment error relative to cell 2 Note 5	µs			-		≤ TAE	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 4 + L* measCycleSCell s from the beginning of time period T2, where *L* is the number of times the discovery signal occasion is not available at the UE during the Event A6 triggered measurement report time.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 4 + L* measCycleSCell s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 4002 + L* measCycleSCell ms in this test case (note: this gives a total of 4 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26.3A E-UTRAN FDD-FS3 3DL Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX

8.26.3A.1 Test purpose

To verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate for multiple FS3 Scell.

8.26.3A.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support LAA for more than one FS3 Scell. Applicability requires support of FGI bit 111.

8.26.3A.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable cell on a secondary component carrier within the cell identification time $T_{identify\_SCC\_FS3}$, where the cell identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_SCC\_FS3\_CRS}$.

$T_{identify\_SCC\_FS3}$ is the time period for cell identification as specified in Table 8.26.3A.3-1,

$T_{measure\_SCC\_FS3\_CRS}$ is the time period for measurements as shown in Table 8.26.3A.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_SCC\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_SCC\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell.

Table 8.26.3A.3-1: Cell identification with deactivated SCell on SCC under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_SCC\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(7+L)*k1*k2**measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		(25+L)*k1*k2**measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(3+L)*k1*k2**measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		(9+L)*k1*k2**measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.

Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

Note 4: The requirements apply, provided that L is such that the cell identification period $T_{identify\_SCC\_FS3}$ does not exceed 75*k1*k2**measCycleSCell.*

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_SCC\_FS3}$:

- RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.3A.3-1.

The measurement period for deactivated SCell measurements is $T_{measure\_SCC\_FS3\_CRS}$ according to the parameter *measCycleSCell* shown in Table 8.26.3A.3-2.

Table 8.26.3A.3-2: Measurement requirements on SCC with deactivated SCell under operation with frame structure 3 with deactivated SCell

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_SCC\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	*(5+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		*(20+M)*k1*k2*measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	*(1+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		*(4+M)*k1*k2*measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.

Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2,\left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

Note 4: The requirements apply, provided that M is such that the time period $T_{measure\_SCC\_FS3\_CRS}$ for measurements does not exceed 60*k1*k2**measCycleSCell*.

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_SCC\_FS3}$ defined in Section 8.26.3A.3. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_SCC\_FS3}$ defined in Section 8.26.3A.3 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_SCC\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.12.2.4.1 and A.8.26.3A.

8.26.3A.4 Test description

8.26.3A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.3A.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.26.3A.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.3A.4.3.

5. There are four E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and three cells on the other E-UTRA FDD carrier specified in the test. Cell1 is PCell on the FDD primary component (RF Channel 1), Cell2 is activated SCell on the secondary component (RF Channel 2) for frame structure 3, Cell3 is deactivated SCell on the secondary component (RF Channel 3) for frame structure 3, and Cell4 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.3A.4.1-1: General test parameters for FDD-FS3 3DL Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2,3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Active SCell			Cell 2	Primary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3 for frame structure 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3 for frame structure 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.18.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331
Filter coefficient			0	L3 filtering is not used
LBT modelling				Not applied for any cell in the test
SCell measurement cycle		ms	160	*measCycleSCell* as specified in TS 36.331
DMTC period		ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
subframeStartPosition			s0	Discovery signal starts from subframe #0
laa-SCellSubframeConfig			00000000	No MBSFN subframe.
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤10	UE should report Event A6 within 8s

8.26.3A.4.2 Test procedure

In the test there are three synchronous cells: Cell1, Cell2, Cell3 and Cell4. Cell1 is PCell on the FDD primary component (RF Channel 1), Cell2 is activated SCell on the secondary component (RF Channel 2) for frame structure 3, Cell3 is deactivated SCell on the secondary component (RF Channel 3) for frame structure 3, and Cell4 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3. Cell 2, Cell 3 and Cell 4 transmit discovery signal with LBT model.

The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. PCell is indicated by the network using IE allowInterruptions and PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/ NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure all relevant SCC's according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell's (Cell 2, Cell 3) on the SCC's as per TS 36.508 [7] clause 5.2A.4. Cell 2 is activated, while Cell 3 is de-activated.
4. Set the parameters according to T1 in Table 8.16.3.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.
6. The UE shall transmit RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.3A.5-1.
8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 8002 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.
11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.3A.4.3 Message contents

Table 8.26.3A.4.3-1: E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.26.3A.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
sCellIndex-r10	2		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 3		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 3		
}			
}			

Table 8.26.3A.4.3-3: *MeasConfig:* Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3, Cell 4	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f3		
reportConfigId[1]	IdReportConfig-A6		
}			
}			
allowInterruptions-r11	TRUE	Cell 1	

Table 8.26.3A.4.3-4: MeasObjectEUTRA-GENERIC(f2): E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	Sf160	Cell 2, Cell 3	
}			

Table 8.26.3A.4.3-5: *ReportConfig-A2*: Additional E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.26.3A.4.3-6: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.26.3A.4.3-7: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.26.3A.4.3-8: *MeasDS-Config-DEFAULT:* Additional E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: 36.508 clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			

8.26.3A.5 Test requirement

Table 8.26.3A.4.1-1 and Table 8.26.3A.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.26.3A.5-1: Cell specific test parameters for FDD-TDD 3DL Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		20		20		20	
PDSCH parameters defined in A.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-		-	
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		-		-	
OCNG Patterns defined in D.1 and D.2		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		OP.8 TDD		OP.7 TDD		OP.7 TDD	
IE allowInterruptions		True		-		-		-	
PBCH_RA	dB	0		0		0		0	
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 3	dBm/15 kHz	-98		-98				-98	
$\hat{E}_s / N_{oc}$	dB	13	13	9.9	9.9	9.9	9.9	-Infinity	9.9
RSRP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-88.1	-88.1	-Infinity	-88.1
$\hat{E}_s / I_{ot}$ Note 4	dB	13	13	9.9	-0.42	9.9	-0.42	-Infinity	-0.42
SCH_RP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-88.1	-88.1	-Infinity	-88.1
Io Note4	dBm/Ch BW	-57.01+10log($N_{RB,c}$/50)		-57.01+10log($N_{RB,c}$/50)		-54.00	-51.09	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2		1x2	
timing offset to cell1	μs	-	-	0	0	0	0	-	3
Time alignment error relative to cell 1 Note 5	μs	-	-	≤ TAE	≤ TAE	≤ TAE	≤ TAE	N/A	N/A

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 8s from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 8 s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 8002 ms in this test case (note: this gives a total of 8 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26.4 E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX

8.26.4.1 Test purpose

To verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause TS 36.331 8.12.2.4 while at the same time fulfilling the requirement on interruption rate.

8.26.4.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 13 and forward that support LAA. Applicability requires support for IE laa-Parameters-r13. Applicability requires support of FGI bit 111.

8.26.4.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.26.3.3.

8.26.4.4 Test description

8.26.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.4.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.26.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.4.4.3.

5. There are two component carriers with one cell on one component carrier and two cells on the other component carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.4.4.1-1: General test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN TDD PCell interruption in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2 for frame structure 3.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2 for frame structure 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 clause 9.1.18.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331
Filter coefficient			0	L3 filtering is not used
LBT modelling			cell2 and cell3	Applied for cell2 and cell3 as specified in C.3.5, yet discovery reference signal is transmitted during each DMTC window with probability P = 1.
SCell measurement cycle		ms	160	*measCycleSCell* as specified in TS 36.331
DMTC period		ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
subframeStartPosition			s0	Discovery signal starts from subframe #0
laa-SCellSubframeConfig			00000000	No MBSFN subframe.
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤5+ L* measCycleSCell	UE should report Event A6 within 4s (20×scellMeasCycle)

8.26.4.4.2 Test procedure

In the test there are three synchronous cells: Cell1, Cell2 and Cell3. Cell1 is PCell on the TDD primary component (RF Channel 1), Cell2 is deactivated SCell on the secondary component (RF Channel 2) for frame structure 3, and Cell3 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3. Cell 2 and Cell 3 transmit discovery signal with LBT model. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. PCell is indicated by the network using IE allowInterruptions and PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/ NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.26.4.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.0. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.4.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 4002 + L* measCycleSCell ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.4.4.3 Message contents

Same message contents as defined in 8.26.3.4.3.

8.26.4.5 Test requirement

Table 8.26.4.4.1-1 and Table 8.26.4.5-1 define the primary level settings including test tolerances for E-UTRAN Event triggered reporting for FS3 on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.26.4.5-1: Cell specific test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN TDD PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		20		20	
Uplink-downlink configuration Note1		1		-		-	
Special subframe configuration Note2		6		-		-	
PDSCH parameters defined in A.1.2		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-		-	
PCFICH/PDCCH/PHICH parameters defined in A.2.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		-		-	
OCNG Patterns defined in D.1 and D.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		OP.14 FDD		OP.14 FDD	
IE allowInterruptions		True		-		-	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98		-98			
$\hat{E}_s / N_{oc}$	dB	13	13	9.9	9.9	-Infinity	9.9
RSRP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-Infinity	-88.1
$\hat{E}_s / I_{ot}$ Note 4	dB	13	13	9.9	-0.42	-Infinity	-0.42
SCH_RP Note 4	dBm/15 kHz	-85	-85	-88.1	-88.1	-Infinity	-88.1
Io Note4	dBm/Ch BW	-57.01+10log($N_{RB,c}$ /50)		-56.89	-54.08	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2	
timing offset to cell1	μs	-		0		0	
timing offset to cell2	μs			-		0	
Time alignment error relative to cell 1 Note 7	μs	-		≤ TAE		≤ TAE	
Time alignment error relative to cell 2 Note 7	μs	-		-		≤ TAE	

Note 1: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 2: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 6: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 4 + L* measCycleSCell s from the beginning of time period T2, where *L* is the number of times the discovery signal occasion is not available at the UE during the Event A6 triggered measurement report time.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 4 + L* measCycleSCell s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 4002 + L* measCycleSCell ms in this test case (note: this gives a total of 4 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26.4A E-UTRAN TDD-FS3 3DL Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerance is missing

- Annex E-2 needs to be updated

- Annex F.1.2 needs to be updated

- Annex F.3.2 needs to be updated.

8.26.4A.1 Test purpose

To verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.12.2.4.1 while at the same time fulfilling the requirement on interruption rate for multiple FS3 Scell.

8.26.4A.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 13 and forward that support LAA for more than one FS3 Scell.

8.26.4A.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable cell on a secondary component carrier within the cell identification time $T_{identify\_SCC\_FS3}$, where the cell identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_SCC\_FS3\_CRS}$.

$T_{identify\_SCC\_FS3}$ is the time period for cell identification as specified in Table 8.26.4A.3-1,

$T_{measure\_SCC\_FS3\_CRS}$ is the time period for measurements as shown in Table 8.26.4A.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_SCC\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_SCC\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell.

Table 8.26.4A.3-1: Cell identification with deactivated SCell on SCC under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_SCC\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(7+L)*k1*k2**measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		(25+L)*k1*k2**measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(3+L)*k1*k2**measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		(9+L)*k1*k2**measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.

Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

Note 4: The requirements apply, provided that L is such that the cell identification period $T_{identify\_SCC\_FS3}$ does not exceed 75*k1*k2**measCycleSCell.*

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_SCC\_FS3}$:

- RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.4A.3-1.

The measurement period for deactivated SCell measurements is $T_{measure\_SCC\_FS3\_CRS}$ according to the parameter *measCycleSCell* shown in Table 8.26.4A.3-1.

Table 8.26.4A.3-2: Measurement requirements on SCC with deactivated SCell under operation with frame structure 3 with deactivated SCell

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_SCC\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	*(5+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	<25		*(20+M)*k1*k2*measCycleSCell*
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	*(1+M)*k1*k2*measCycleSCell*
-6 ≤ SCH Ês/Iot < 0	≥ 25		*(4+M)*k1*k2*measCycleSCell*

Note 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

Note 2: The requirements for measurement bandwidth ≥ 25 RB are optional.

Note 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC}=0.

Note 4: The requirements apply, provided that M is such that the time period $T_{measure\_SCC\_FS3\_CRS}$ for measurements does not exceed 60*k1*k2**measCycleSCell*.

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_SCC\_FS3}$ defined in Section 8.26.4A.3. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_SCC\_FS3}$ defined in Section 8.26.4A.3 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_SCC\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.12.2.4.1 and A.8.26.4A.

8.26.4A.4 Test description

8.26.4A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for PCC and 20 MHz for SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.26.4A.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.4A.4.3.

5. Cell1 is PCell on the TDD primary component (RF Channel 1), Cell2 is activated SCell on the secondary component (RF Channel 2) for frame structure 3, Cell3 is deactivated SCell on the secondary component (RF Channel 3) for frame structure 3, and Cell4 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3.. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 , Cell 3 and Cell 4 shall be powered OFF.

Table 8.26.4A.4.1-1: General test parameters for TDD-TDD 3DL Event triggered reporting on LAA deactivated SCell with E-UTRAN TDD PCell interruption in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2,3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Active SCell			Cell 2	Primary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3 for frame structure 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3 for frame structure 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.18.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331
Filter coefficient			0	L3 filtering is not used
LBT modelling				Not applied for any cell in the test
SCell measurement cycle		ms	160	*measCycleSCell* as specified in TS 36.331
DMTC period		ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
subframeStartPosition			s0	Discovery signal starts from subframe #0
laa-SCellSubframeConfig			00000000	No MBSFN subframe.
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤10	UE should report Event A6 within 8 s

8.26.4A.4.2 Test procedure

In the test there are three synchronous cells: Cell1, Cell2, Cell3 and Cell4. Cell1 is PCell on the TDD primary component (RF Channel 1), Cell2 is activated SCell on the secondary component (RF Channel 2) for frame structure 3, Cell3 is deactivated SCell on the secondary component (RF Channel 3) for frame structure 3, and Cell4 is the neighbour cell on the secondary component (RF Channel 3) for frame structure 3. Cell 2, Cell 3 and Cell 4 transmit discovery signal with LBT model.

The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. PCell is indicated by the network using IE allowInterruptions and PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/ NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure all relevant SCC's according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell's (Cell 2, Cell 3) on the SCC's as per TS 36.508 [7] clause 5.2A.4.
4. Set the parameters according to T1 in Table 8.26.4A.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.
6. The UE shall transmit RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.4A.5-1.
8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 8002 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.
11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.4A.4.3 Message contents

Table 8.26.4A.4.3-1: E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.26.4A.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.26.4A.4.3-3: *MeasConfig:* Additional E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.26.4A.4.3-4: MeasObjectEUTRA-GENERIC(f2): E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	Sf160		
}			

Table 8.26.4A.4.3-5: *ReportConfig-A2*: Additional E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.26.4A.4.3-6: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.26.4A.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.26.4A.4.3-8: MeasDS-Config-DEFAULT*:* Additional E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell test requirements

Derivation Path: 36.508 clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			

8.26.4A.5 Test requirement

Table 8.26.4A.4.1-1 and Table 8.26.4A.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.26.4A.5-1: Cell specific test parameters for TDD-TDD 3DL Event triggered reporting on LAA deactivated SCell with E-UTRAN TDD PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		20		20		20	
Uplink-downlink configuration Note1		1		1		-		-	
Special subframe configuration Note2		6		6		-		-	
PDSCH parameters defined in A.3.1.1.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-		-	
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		-		-	
OCNG Patterns defined in A.3.2.1		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		OP.8 TDD		OP.7 TDD		OP.7 TDD	
IE allowInterruptions		True		-		-		-	
PBCH_RA	dB	0		0		0		0	
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 3	dBm/15 kHz	-98		-98				-98	
$\hat{E}_s / N_{oc}$	dB	13	13	13	13	13	13	-Infinity	13
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s / I_{ot}$ Note 4	dB	13	13	13	13	13	-0.21	-Infinity	-0.21
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-Infinity	-85
Io Note4	dBm/Ch BW	-57.01+10log($N_{RB,c}$ /50)		-57.01+10log($N_{RB,c}$ /50)		-54.00	-51.09	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN		AWGN	
Antenna Configuration		1x2		1x2		1x2		1x2	
timing offset to cell1	μs	-	-	0	0	0	0	-	3
Time alignment error relative to cell 1 Note 5	μs	-	-	≤ TAE	≤ TAE	≤ TAE	≤ TAE	N/A	N/A

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 8s from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 8 s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 8002 ms in this test case (note: this gives a total of 8 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26.5 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal

8.26.5.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.5.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support LAA for only one FS3 SCell. Applicability requires support of FGI bit 111.

8.26.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3,}$ where the identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS}$, where:

$T_{identify\_intra\_FS3}$ is the intra-frequency cell identification period as specified in Table 8.26.5.3-1,

$T_{measure\_intra\_FS3\_CRS}$ is the intra-frequency period for measurements as shown in Table 8.26.5.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_intra\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

Table 8.26.5.3-1: Intra-frequency cell identification requirement under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(24+L) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(2+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(8+L) * $T_{DMTC\_periodicity}$
NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.			

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3}$:

- RSRP related side conditions given in TS 36.133 Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.5.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS}$ as shown in Table 8.26.5.3-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS}$.

Table 8.26.5.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(20+M) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(1+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(4+M) * $T_{DMTC\_periodicity}$

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.

NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.

NOTE 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

NOTE 4: The requirements apply, provided that L is such that the intra-frequency cell identification period $T_{identify\_intra\_FS3}$ does not exceed 72*k1*k2 $T_{DMTC\_periodicity}$.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1 becomes undetectable for a period $\leq$ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.5.

8.26.5.4 Test description

8.26.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.5.4.3.
5. Cell 1 is PCell on the FDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.5.4.1-1: General test parameters for E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.5.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.5.4.3.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Table 8.26.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 configured.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.5.5-1.
9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-12 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.5.4.3-1: Common Exception messages for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.26.5.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-19D: SCellToAddMod-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.26.5.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-13A: RadioResourceConfigCommonSCell-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
tdd-Config-r10	Not present		
}			
}			

Table 8.26.5.4.3-4: *MeasObjectEUTRA-GENERIC(Freq)*: E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

8.26.5.5 Test requirement

Table 8.26.5.4.1-1 and Table 8.26.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.5.5-1: Cell specific test parameters for E-UTRAN FS3 TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
LBT model		-		-		C.3.5	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		47-52		47-52	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		R.1 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		OP.13 FDD		OP.14 FDD	
PBCH_RA	dB	0					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/ 15 kHz	-104		-104			
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.455	-infinity	-1.455
RSRP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/ Ch BW	-70.76+10log($N_{RB,c}$ /50)	-70.76+10log($N_{RB,c}$ /50)	-67.75	-65.41	-67.75	-65.41
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the

type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3} = (24+L) * T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity}$ = 40 ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.5A E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal with 2 SCells

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerance is missing

- Annex E-2 needs to be updated

- Annex F.1.2 needs to be updated

- Annex F.3.2 needs to be updated

8.26.5A.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.5A.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support LAA for more than one FS3 SCells. Applicability requires support of FGI bit 111.

8.26.5A.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3,}$ where the identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS}$, where:

$T_{identify\_intra\_FS3}$ is the intra-frequency cell identification period as specified in Table 8.26.5A.3-1,

$T_{measure\_intra\_FS3\_CRS}$ is the intra-frequency period for measurements as shown in Table 8.26.5A.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_intra\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

Table 8.26.5A.3-1: Intra-frequency cell identification requirement under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(24+L) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(2+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(8+L) * $T_{DMTC\_periodicity}$
NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.			

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3}$:

- RSRP related side conditions given in TS 36.133 Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.5A.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS}$ as shown in Table 8.26.5A.3-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS}$.

Table 8.26.5A.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(20+M) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	(1+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥25		(4+M) * $T_{DMTC\_periodicity}$

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

NOTE 4: The requirements apply, provided that L is such that the intra-frequency cell identification period $T_{identify\_intra\_FS3}$ does not exceed 72*k1*k2 $T_{DMTC\_periodicity}$.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.5A.

8.26.5A.4 Test description

8.26.5A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.5A.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.5A.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.5A.4.3.
5. Cell 1 is PCell on the FDD primary component carrier (RF Channel 1), Cell 2 and Cell 4 are activated SCell on the secondary component carrier (RF Channel 2 and RF Channel 3 respectively) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) for frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.26.5A.4.1-1: General test parameters for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2,3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
Active SCell		Cell 4	Configured activated secondary cell on RF channel number 3.
DMTC period	ms	40	Applies for cell 2,3 and 4 as specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	Applies for cell 2,3 and 4 as specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	Applies for cell 2,3, and 4 as specified in IE MeasDS-Config in TS 36.331
LBT modelling			Not applied for any cell in the test
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.5A.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2 and Cell 4) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.5A.4.3.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.26.5A.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with event A6 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.5A.5-1.

9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-12 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.5A.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.5A.4.3-1: Common Exception messages for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.26.5A.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-19D: SCellToAddMod-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	k	k = 1 for Cell2 k = 2 for Cell4	
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell M	M = 2,4	
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell M		
}			
}			

Table 8.26.5A.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-13A: RadioResourceConfigCommonSCell-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell M	M = 2,4	
tdd-Config-r10	Not present		
}			
}			

Table 8.26.5A.4.3-4: *MeasObjectEUTRA-GENERIC(Freq)*: E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

8.26.5A.5 Test requirement

Table 8.26.5A.4.1-1 and Table 8.26.5A.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.5A.5-1: Cell specific test parameters for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3		Cell4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2		3	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20		20	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		47-52		47-52		47-52	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		R.0 FS3		-		R.0 FS3	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		R.0 FS3		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		OP.13 FDD		OP.14 FDD		OP.13 FDD	
PBCH_RA	dB	0							
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 2	dBm/15 kHz	-104		-104				-104	
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	- infinity	4	4	
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.455	- infinity	-1.455	4	
RSRP Note 3	dBm/15 kHz	-100	-100	-100	-100	- infinity	-100	-100	
SCH_RP Note 3	dBm/15 kHz	-100	-100	-100	-100	- infinity	-100	-100	
Io Note 3	dBm/Ch BW	-70.76+10log (NRB,c /50)	-70.76+10log (NRB,c /50)	-67.75	-65.41	-67.75	-65.41	-67.75	
Propagation Condition		ETU30		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3	0	
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE	N/A	

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3.}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3} = (24+L) * T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity}$ = 40 ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.6 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal

8.26.6.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.6.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA for only one FS3 SCell. Applicability requires support of FGI bit 111.

8.26.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3,}$ where the identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS}$, where:

$T_{identify\_intra\_FS3}$ is the intra-frequency cell identification period as specified in Table 8.26.6.3-1,

$T_{measure\_intra\_FS3\_CRS}$ is the intra-frequency period for measurements as shown in Table 8.26.6.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_intra\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

Table 8.26.6.3-1: Intra-frequency cell identification requirement under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(24+L) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(2+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(8+L) * $T_{DMTC\_periodicity}$
NOTE 1 : Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.			

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3}$:

- RSRP related side conditions given in TS 36.133 Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.6.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS}$ as shown in Table 8.26.6.3-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS}$.

Table 8.26.6.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(20+M) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(1+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(4+M) * $T_{DMTC\_periodicity}$

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency measurements in DMTC occasions or for inter-frequency RSSI measurements in RMTC occasions on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

NOTE 4: The requirements apply, provided that L is such that the intra-frequency cell identification period $T_{identify\_intra\_FS3}$ does not exceed 72*k1*k2 $T_{DMTC\_periodicity}$.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.6.

8.26.6.4 Test description

8.26.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.6.5-1 as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.

2. The general test parameter settings are set up according to Table 8.26.6.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 8.26.6.4.3.

5. Cell 1 is PCell on the TDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.6.4.3.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.26.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.6.5-1.

9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event "A6". Otherwise count a fail for the event "A6".

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat step 3-12 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.6.4.3 Message contents

Message contents are the same as in Clause 8.26.5.4.3.

8.26.6.5 Test requirement

Table 8.26.6.4.1-1 and Table 8.26.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
Special subframe configuration		6		-		-	
Uplink-downlink configuration		1		-		-	
LBT model		-		-		C.3.5	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		38-62		38-62	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD		R.0 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD		OP.13 FDD		OP.14 FDD	
PBCH_RA	dB	0					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/ 15 kHz	-104		-104			
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.455	-infinity	-1.455
RSRP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/ Ch BW	-70.76+10log($N_{RB,c}$ /50)	-70.76+10log($N_{RB,c}$ /50)	-67.75	-65.41	-67.75	-65.41
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE
Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral							

	density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay $= T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3} = (24+L) * T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity} = 40$ ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty $= 2xTTI_{DCCH} = 2$ ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.6A E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal with 2 SCells

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerance is missing

- Annex E-2 needs to be updated

- Annex F.1.2 needs to be updated

- Annex F.3.2 needs to be updated.

8.26.6A.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.6A.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support LAA for more than one FS3 SCells. Applicability requires support of FGI bit 111.

8.26.6A.3 Minimum conformance requirements

Minimum conformance requirements are same as in Clause 8.26.5A.3.

8.26.6A.4 Test description

8.26.6A.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.6A.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.6A.4.3.
5. Cell 1 is PCell on the TDD primary component carrier (RF Channel 1), Cell 2 and Cell 4 are activated SCell on the secondary component carrier (RF Channel 2 and RF Channel 4 respectively) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) for frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.26.6A.4.1-1: General test parameters for E-UTRAN TDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
Active SCell		Cell 4	Configured activated secondary cell on RF channel number 3.
DMTC period	ms	40	Applies for cell 2,3 and 4 as specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	Applies for cell 2,3 and 4 as specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	Applies for cell 2,3 and 4 as specified in IE MeasDS-Config in TS 36.331
LBT modelling			Not applied for any cell in the test
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.6A.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2 and Cell 4) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.6A.4.3.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Table 8.26.6A.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 configured.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.6A.5-1.
9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat step 3-12 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.6A.4.3 Message contents

Message contents are the same as in Clause 8.26.5A.4.3.

8.26.6A.5 Test requirement

Table 8.26.6A.4.1-1 and Table 8.26.6A.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.6A.5-1: Cell specific test parameters for E-UTRAN TDD-FS3 intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2		3	
Special subframe configuration		6		-		-		-	
Uplink-downlink configuration		1		-		-		-	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20		20	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz:47-52		38-62		38-62		38-62	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD		R.0 FS3		-		R.0 FS3	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD		OP.13 FDD		OP.14 FDD		OP.13 FDD	
PBCH_RA	dB	0							
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB								
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
N_{oc} Note 2	dBm/ 15 kHz	-104		-104				-104	
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	4	4	
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.455	-infinity	-1.455	4	
RSRP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100	-100	
SCH_RP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100	-100	
Io Note 3	dBm/ Ch BW	-70.76+10log($N_{RB,c}$ /50)	-70.76+10log($N_{RB,c}$ /50)	-67.75	-65.41	-67.75	-65.41	-67.75	
Propagation Condition		ETU30		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3	0	
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE	N/A	

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3.}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay $= T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3} = (24+L) * T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity}$ = 40 ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.7 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

8.26.7.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in DRX requirements in TS 36.133 [4] clause 8.11.2.

8.26.7.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA. Applicability requires support for FGI bits 5 and 111.

8.26.7.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3\_DRX}$, where the cell identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS\_DRX}$, where:

$T_{identify\_intra\_FS3\_DRX}$ is the intra-frequency period for cell identification as shown in Table 8.26.7.3-1,

$T_{measure\_intra\_FS3\_CRS\_DRX}$ is the intra-frequency period for measurements as shown in Table 8.26.7.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{identify\_intra\_FS3\_DRX}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{measure\_intra\_FS3\_CRS\_DRX}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

Table 8.26.7.3-1: Intra-frequency cell identification requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3\_DRX}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	<25		(24+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	(2+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	≥25		(8+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency in DMTC occasions measurements on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell during ON DURATION; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell during ON DURATION or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells during ON DURATION on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

NOTE 4: The requirements apply, provided that L is such that the intra-frequency cell identification period $T_{identify\_intra\_FS3\_DRX}$ does not exceed 72*k1*k2* Max{$T_{DMTC\_periodicity}$, DRX cycle length}.

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3\_DRX}$:

- RSRP related side conditions given in TS 36.133 [4] section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 [4] Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.7.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS\_DRX}$ as shown in Table 8.26.7.3-2, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS\_DRX}$.

Table 8.26.7.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS\_DRX}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	<25		(20+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	(1+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	≥25		(4+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency in DMTC occasions measurements on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell during ON DURATION; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell during ON DURATION or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells during ON DURATION on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3\_DRX}$ defined in TS 36.133 [4] section 8.11.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3\_DRX}$ defined in TS 36.133 [4] section 8.11.2.1.1.2 becomes undetectable for a period $\leq$ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_FS3\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.7.

8.26.7.4 Test description

8.26.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.7.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.7.4.3.
5. Cell 1 is PCell on the FDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.7.4.1-1: General test parameters for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331 [5]
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.26.7.5-2
T1	s	5	
T2	s	15	During this time the UE identify a new detectable FS3 intra-frequency cell, $T_{identify\_intra\_FS3\_DRX}$ is specified in Table 8.26.7.3-1.

8.26.7.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.7.4.3.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.26.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with event A6 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.7.5-1.

9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 7682+L*320 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell 3, then count a success for the event "A6". Otherwise count a fail for the event "A6".

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat step 3-12 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.7.4.3-1: Common Exception messages for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.26.7.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-19D: SCellToAddMod-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.26.7.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-13A: RadioResourceConfigCommonSCell-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
tdd-Config-r10	Not present		
}			
}			

Table 8.26.7.4.3-4: *MeasObjectEUTRA-GENERIC(Freq)*: E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.26.7.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf320	10		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.26.7.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

8.26.7.5 Test requirement

Table 8.26.7.4.1-1 and Table 8.26.7.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD intra-frequency event triggered reporting in DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.7.5-1: Cell specific test parameters for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
LBT model		-		-		C.3.5	
Measurement bandwidth	n_{PRB}	5MHz:10-15 10MHz:22-27 20MHz:47-52		47-52		47-52	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		R.1 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		OP.13 FDD		OP.14 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/ 15 kHz	-104		-104			
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.46	-infinity	-1.46
RSRP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/ Ch BW	-70.76+10log($N_{RB,c}$ /50)	-70.76+10log($N_{RB,c}$ /50)	-67.76	-65.42	Specified in columns for Cell 2	
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	µs	-	-	≤ TAE	≤ TAE	N/A	N/A

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1.

Table 8.26.7.5-2: DRX-Configuration for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf6	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf320 : 10	
shortDRX	disable	

Table 8.26.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section10.1 in TS 36.213 [8].

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3\_DRX}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_intra\_FS3\_DRX}$

$T_{identify\_intra\_FS3\_DRX}$ = (24+L)*k1*k2*DRX cycle length (as DRX cycle length of 320ms is longer than $T_{DMTC\_periodicity}$ of 40ms)

k1 = 1 and k2 = 1 as no overlaps of measurement gaps or DMTC occasions, and DRX cycle length = 320ms.

L is the number of configured discovery signal occasions during ON DURATION which are not available during $T_{identify\_intra\_FS3\_DRX}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 7682+L*320 ms from the beginning of time T2 (note: this gives a total of 7680+L*320 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.8 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

8.26.8.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in DRX requirements in TS 36.133 [4] clause 8.11.2.

8.26.8.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA. Applicability requires support for FGI bits 5 and 111.

8.26.8.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3\_DRX}$, where the cell identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS\_DRX}$, where:

$T_{identify\_intra\_FS3\_DRX}$ is the intra-frequency period for cell identification as shown in Table 8.26.8.3-1,

$T_{measure\_intra\_FS3\_CRS\_DRX}$ is the intra-frequency period for measurements as shown in Table 8.26.8.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{identify\_intra\_FS3\_DRX}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{measure\_intra\_FS3\_CRS\_DRX}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

Table 8.26.8.3-1: Intra-frequency cell identification requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3\_DRX}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	<25		(24+L)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	(2+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	≥25		(8+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency in DMTC occasions measurements on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell during ON DURATION; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell during ON DURATION or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.
k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells during ON DURATION on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.
NOTE 4: The requirements apply, provided that L is such that the intra-frequency cell identification period $T_{identify\_intra\_FS3\_DRX}$ does not exceed 72*k1*k2* Max{$T_{DMTC\_periodicity}$, DRX cycle length}.

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3\_DRX}$:

- RSRP related side conditions given in TS 36.133 [4] section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 [4] Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.8.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS\_DRX}$ as shown in Table 8.26.8.3-2, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS\_DRX}$.

Table 8.26.8.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS\_DRX}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	<25		(20+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	(1+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}
-6 ≤ SCH Ês/Iot < 0	≥25		(4+M)* k1*k2*Max{$T_{DMTC\_periodicity}$, DRX cycle length}

NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms.
NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.
NOTE 3: k1=2 when the measurement gaps configured for inter-frequency in DMTC occasions measurements on a carrier with frame structure 3 overlap with some but not all DMTC occasions of the measured cell during ON DURATION; otherwise, k1=1, e.g., when measurement gaps configured for inter-frequency measurements on a carrier with frame structure 3 do not overlap with DMTC occasions of the measured cell during ON DURATION or when the UE does not require the measurement gaps for the inter-frequency measurements. The requirements apply, provided that the inter-frequency measurement gap pattern does not overlap with all DMTC occasions of the measured cell.

k2= $\max\left(2, \left\lceil \frac{N_{FS3\_SCC}}{2} \right\rceil\right)$ when DMTC occasions in the measured cell not overlapping with the inter-frequency measurement gaps measurement gaps overlap with DMTC occasions of N_{FS3_SCC} (N_{FS3_SCC}>0) SCells during ON DURATION on other FS3 carriers; otherwise, k2=1, e.g., when N_{FS3_SCC} is 0.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3\_DRX}$ defined in TS 36.133 [4] section 8.11.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3\_DRX}$ defined in TS 36.133 [4] section 8.11.2.1.1.2 becomes undetectable for a period $\leq$ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.8.

8.26.8.4 Test description

8.26.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.26.8.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.8.4.3.
5. Cell 1 is PCell on the FDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.8.4.1-1: General test parameters for E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331 [5]
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.26.8.5-2
T1	s	5	
T2	s	15	

8.26.8.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.8.4.3.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.26.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with event A6 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.8.5-1.

9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 7682+L*320 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell 3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

12. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat step 3-11 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.8.4.3-1: Common Exception messages for E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-5 Table H.4.1-6

Table 8.26.8.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-19D: SCellToAddMod-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.26.8.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7], Table 4.6.3-13A: RadioResourceConfigCommonSCell-r10-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
tdd-Config-r10	Not present		
}			
}			

Table 8.26.8.4.3-4: *MeasObjectEUTRA-GENERIC(Freq)*: Additional E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.26.8.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf320	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.26.8.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

8.26.8.5 Test requirement

Table 8.26.8.4.1-1 and Table 8.26.8.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.8.5-1: Cell specific test parameters for E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
Special subframe configuration		6		-		-	
Uplink-downlink configuration		1		-		-	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
Measurement bandwidth	n_{PRB}	5MHz:10-15 10MHz:22-27 20MHz:47-52		47-52		47-52	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD		R.0 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD		OP.13 FDD		OP.14 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						

PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/ 15 kHz	-104		-104			
$\hat{E}_s / N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s / I_{ot}$	dB	4	4	4	-1.46	-infinity	-1.46
RSRP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/ 15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/ Ch BW	-70.76+10log($N_{RB,c}$ /50)	-70.76+10log($N_{RB,c}$ /50)	-67.76	-65.42	Specified in columns for Cell 2	
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	μs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	μs	-	-	≤ TAE	≤ TAE	N/A	N/A

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1.

Table 8.26.8.5-2: DRX-Configuration for E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf320	
shortDRX	disable	

Table 8.26.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section10.1 in TS 36.213 [8].

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3\_DRX}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_intra\_FS3\_DRX}$

$T_{identify\_intra\_FS3\_DRX}$ = (24+L)*k1*k2*DRX cycle length (as DRX cycle length of 320ms is longer than $T_{DMTC\_periodicity}$ of 40ms)

k1 = 1 and k2 = 1 as no overlaps of measurement gaps or DMTC occasions, and DRX cycle length = 320ms.

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3\_DRX}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 7682+L*320 ms from the beginning of time T2 (note: this gives a total of 7680+L*320 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.9 E-UTRAN FDD-FS3 Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.26.9.1 Test purpose

To verify the UE's ability to make a correct reporting of a event A4 under fading propagation conditions in synchronous cells within the E-UTRA FDD – Frame Structure 3 inter-frequency cell search requirements. This test will verify the FDD-FS3 inter-frequency cell search requirements in section 8.3.3.2.1 of [4].

8.26.9.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and FS3 release 13 and forward. Applicability requires support for FGI bit 25.

8.26.9.3 Minimum conformance requirements

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [5].

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH $\hat{E}s/Iot$ according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 in TS 36.133 [4] (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8 in TS 36.133 [4].

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the applicable requirements in clause 9 in TS 36.133 [4].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in Clause 8.3.3.2.1 in TS 36.133 [4]. When L3 filtering is used or IDC autonomous denial is configured, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in clause 8.3.3.2.1 in TS 36.133 [4] becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering, or the UE is configured to perform SRS carrier based switching, is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.26.9.

8.26.9.4 Test description

8.26.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest bandwidth of the corresponding to be tested E-UTRAN band as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and the AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.26.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.9.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA FS3 Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.26.9.4.1-1: General test parameters for E-UTRAN FDD-FS3 inter-frequency event triggered reporting in fading propagation conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One FDD carrier frequency is used for active cell and one FS3 carrier frequency is used for neighbour cell.
Active cell			Cell 1	Cell 1 is on RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on RF channel number 2
DMTC period			40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration			1	As specified in IE MeasDS-Config in TS 36.331
Gap Pattern Id			0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset			8	As specified in IE MeasGapConfig in TS 36.331
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-105	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	OFF
Time offset between cells			0 ms	Synchronous cells
T1		s	5	
T2		s	1	

8.26.9.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0 is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.26.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.9.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A4. If the measurement reporting delay from the beginning of time period T2 is less than (3+L)*40 + 2 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and

ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.9.4.3-1: Common Exception messages for Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H.3.1-7

Table 8.26.9.4.3-2: *MeasConfigEUTRA-A4*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A4		
reportConfig	ReportConfigEUTRA-A4		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A4		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.26.9.4.3-3: *ReportConfigEUTRA-A4*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6AA ReportConfigEUTRA-A4(Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA4 SEQUENCE {			
a4-Threshold CHOICE{			
threshold-RSRP	35 (-105)	-105 is actual threshold value in dBm	Not RSRQ
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.26.9.4.3-4: *MeasResults*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.26.9.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.26.9.4.3-6: MeasGapConfig-GP1: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1A MeasGapConfig-GP1:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig-GP1 ::= CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp0	8	TGRP = 40 ms	
}			
}			
}			

8.26.9.5 Test requirement

Tables 8.26.9.4.1-1 and 8.26.9.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous FDD-FS3 inter frequency cells test.

Table 8.26.9.5-1: Cell specific test parameters for E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
Frame Structure		FDD		FS3	
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	5 MHz:$N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz: $N_{RB,c}$ = 100		20 MHz: $N_{RB,c}$ = 100	
LBT model		-		C.3.5	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.1.1 and A.1.6 (R.0 FS3)		5 MHz: R.5 FDD 10 MHz: R.0 FDD 20 MHz: R.4 FDD		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.4 (R.0 FS3)		5 MHz: R.11 FDD 10 MHz: R.6 FDD 20 MHz: R.10 FDD		R.0 FS3	
OCNG Patterns defined in D.1		5 MHz: OP.15 FDD 10 MHz: OP.1 FDD 20 MHz: OP.11 FDD		OP.14 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
RSRP Note 4	dBm/15 kHz	-94	-94	-inf	-91
$\hat{E}_s / I_{ot}$	dB	4	4	-inf	7
SCH_RP Note 4	dBm/15 kHz	-94	-94	-inf	-91
$\hat{E}_s / N_{oc}$	dB	4	4	-inf	7
Io	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-64.76 +10log ($N_{RB,c}$ /50)	-67.21	-59.42
Propagation Condition		ETU30		ETU30	

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Void

The UE shall send one Event A4 triggered measurement report, with a measurement reporting delay less than (3+L)*40 ms from the beginning of time period T2. L is the number of configured discovery signal occasions which are not available during the time for cell identification at the UE during measurement gaps due to the absence of the necessary radio signals from the measured cell.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A4 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = (3+L)*40 ms

L is 1 in this case giving a measurement reporting delay of 160ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 162 ms in this test case (note: a total of 160 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.10 E-UTRAN TDD-FS3 Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.26.10.1 Test purpose

To verify the UE's ability to make a correct reporting of a event A4 under fading propagation conditions in synchronous cells within the E-UTRA TDD – Frame Structure 3 inter-frequency cell search requirements. This test will verify the TDD-FS3 inter-frequency cell search requirements in section 8.3.3.2.1.

8.26.10.2 Test applicability

This test applies to all types of E-UTRA UE supporting TDD and FS3 release 13 and forward. Applicability requires support for FGI bit 25.

8.26.10.3 Minimum conformance requirements

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [5].

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 in TS 36.133 [4] are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 in TS 36.133 [4] (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8 in TS 36.133 [4].

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the applicable requirements in clause 9 in TS 36.133 [4].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in Clause 8.3.3.2.1 in TS 36.133 [4]. When L3 filtering is used or IDC autonomous denial is configured, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in clause 8.3.3.2.1 in TS 36.133 [4] becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering, or the UE is configured to perform SRS carrier based switching, is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.26.10.

8.26.10.4 Test description

8.26.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest bandwidth of the corresponding to be tested E-UTRAN band as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.26.10.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.10.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FS3 Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.26.10.4.1-1: General test parameters for E-UTRAN TDD-FS3 inter-frequency event triggered reporting in fading propagation conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One TDD carrier frequency is used for active cell and one FS3 carrier frequency is used for neighbour cell.
Active cell			Cell 1	Cell 1 is on RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on RF channel number 2
DMTC period			40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration			1	As specified in IE MeasDS-Config in TS 36.331
Gap Pattern Id			0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset			8	As specified in IE MeasGapConfig in TS 36.331
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-105	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	OFF
Time offset between cells			0 ms	Synchronous cells
T1		s	5	
T2		s	1	

8.26.10.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.26.10.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.10.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A4. If the measurement reporting delay from the beginning of time period T2 is less than (3+L)*40 + 2 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is

in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.10.4.3-1: Common Exception messages for Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H.3.1-7

Table 8.26.10.4.3-2: *MeasConfigEUTRA-A4*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A4		
reportConfig	ReportConfigEUTRA-A4		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A4		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.26.10.4.3-3: *ReportConfigEUTRA-A4*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6AA ReportConfigEUTRA-A4(Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA4 SEQUENCE {			
a4-Threshold CHOICE{			
threshold-RSRP	35 (-105)	-105 is actual threshold value in dBm	Not RSRQ
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.26.10.4.3-4: *MeasResults*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.26.10.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.26.10.4.3-6: MeasGapConfig-GP1: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1A MeasGapConfig-GP1:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig-GP1 ::= CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp0	8	TGRP = 40 ms	
}			
}			
}			

8.26.10.5 Test requirement

Tables 8.26.10.4.1-1 and 8.26.10.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous TDD-FS3 inter frequency cells test.

Table 8.26.10.5-1: Cell specific test parameters for E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
Frame Structure		TDD		FS3	
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	5 MHz: $N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz:$N_{RB,c}$ = 100		20 MHz:$N_{RB,c}$ = 100	
Special subframe configuration		6		-	
Uplink-downlink configuration		1		-	
LBT model		-		C.3.5	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.1.2 (R.3 TDD) and A.1.6 (R.0 FS3)		R.3 TDD		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2and A.2.4 (R.0 FS3)		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3	
OCNG Patterns defined in D.2 and D.1		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		OP.14 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
RSRP Note 4	dBm/15 kHz	-94	-94	-inf	-91
$\hat{E}_s / I_{ot}$	dB	4	4	-inf	7
SCH_RP Note 4	dBm/15 kHz	-94	-94	-inf	-91
$\hat{E}_s / N_{oc}$	dB	4	4	-inf	7
Io	dBm/Ch BW	-64.76 +10log ($N_{RB,c}$ /50)	-64.76 +10log ($N_{RB,c}$ /50)	-67.21	-59.42
Propagation Condition		ETU30		ETU30	

Note 1:	OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.
Note 2:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	Void

The UE shall send one Event A4 triggered measurement report, with a measurement reporting delay less than (3+L)*40 ms from the beginning of time period T2. L is the number of configured discovery signal occasions which are not available during the time for cell identification at the UE during measurement gaps due to the absence of the necessary radio signals from the measured cell.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A4 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = (3+L)*40 ms

L is 1 in this case giving a measurement reporting delay of 160ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 162 ms in this test case (note: a total of 160 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

9 Measurement Performance Requirements

When the UE is in RRC_CONNECTED state on a cell, physical layer measurements as defined in TS 36.214 [12] clause 5 are initiated and reported to higher layers. To initiate a specific measurement, the System Simulator sends a 'RRC Connection Reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), the physical layer measurement process takes place. In this process when the reporting criteria are fulfilled the UE sends a 'Measurement Report message' to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a 'Measurement Report message' to the System Simulator is periodical as defined in TS 36.331 [5] clause 5.5.4. The physical layer measurements succeed only if the performance results in terms of accuracy are within the specified limits.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions and assume independent interference (noise) at each receiver antenna port.

The reported measurement results after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period.

The accuracy requirements are valid for the reported measurement results after layer 1 filtering.

Unless explicitly stated:

- In state RRC_CONNECTED
- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is as defined in Annex A. This measurement channel is used both in active cell and cells to be measured.
- The reference channels assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.
- SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.
- Uplink is configured according to Annex A.3.
- Propagation condition is AWGN as defined in Annex B.
- Physical channels used as defined in Annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

NOTE: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.

For RSRP accuracy test cases with more than 5 Cells, the Intra-frequency relative RSRP accuracy can be measured on each SCC by time-switching the neighbour cell sequentially instead of measuring all the neighbour cells simultaneously. The PCell and all SCells shall remain active, and the UE shall be configured to measure all the PCell, SCells throughout the test.

9.1 RSRP

9.1.1 FDD Intra frequency RSRP Accuracy

9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy

9.1.1.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bit 16.

9.1.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.1.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.1.

9.1.1.1.4 Test description

9.1.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.1.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.1.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.1.1.5-2 as appropriate.

9.1.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.1.5 Test requirement

Table 9.1.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1.5-3.

Table 9.1.1.1.5-1: Void

Table 9.1.1.1.5-2: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	115.0						115.5	
	Bands FDD_C						-115.0	
	Bands FDD_D						-114.5	
	Bands FDD_E [Note 5], FDD_F						-114.0	
	Bands FDD_G						-113.0	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113.0	-116.2
	FDD_B1, FDD_B2						-112.5	-115.7
	Bands FDD_C						-112.0	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F [Note 5]						-111.0	-114.2
	Bands FDD_G						-110.0	-113.2
	Bands FDD_H						-109.5	-112.7
Io[Note3]	Bands FDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands FDD_B1, FDD_B2						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F [Note 5]						-80.25	
	Bands FDD_G						-79.25	
	Bands FDD_H						-78.75	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.1.5-3: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_28	RSRP_45	Bands FDD_A	RSRP_17
			Bands FDD_B1, FDD_B2	RSRP_17
			Bands FDD_C	RSRP_18
			Bands FDD_D	RSRP_18
			Bands FDD_E, FDD_F	RSRP_19
			Bands FDD_G	RSRP_20
			Bands FDD_H	RSRP_20
Highest reported value (Cell 2)	RSRP_43	RSRP_64	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_D	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands FDD_A	RSRP_14
			Bands FDD_B1, FDD_B2	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands FDD_A	RSRP_35
			Bands FDD_B1, FDD_B2	RSRP_35
			Bands FDD_C	RSRP_36
			Bands FDD_D	RSRP_36
			Bands FDD_E, FDD_F	RSRP_37
			Bands FDD_G	RSRP_38
			Bands FDD_H	RSRP_38
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.1.1_1.1 Test purpose

Same test purpose as in clause 9.1.1.1.1.

9.1.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.1.1.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.1.1_1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.1.

9.1.1.1_1.4 Test description

9.1.1.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.1.1.4.1 with the following exceptions:

- Instead of 9.1.1.1.4.3 → use 9.1.1.1_1.4.3.

9.1.1.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.1.1_1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.1.1_1.5-2.

9.1.1.1_1.4.3 Message contents

Same message contents as in clause 9.1.1.1.4.3.

9.1.1.1_1.5 Test requirement

Table 9.1.1.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1_1.5-2.

Table 9.1.1.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands FDD_B1, FDD_B2						115.5	
	Bands FDD_C						-115.0	
	Bands FDD_D						-114.5	
	Bands FDD_E FDD_F [Note 5]						-114.0	
	Bands FDD_G						-113.0	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113.0	-116.2
	Bands FDD_B1, FDD_B2						-112.5	-115.7
	Bands FDD_C						-112.0	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F [Note 5]						-111.0	-114.2
	Bands FDD_G						-110.0	-113.2
	Bands FDD_H						-109.5	-112.7
Io[Note3]	Bands FDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands FDD_B1, FDD_B2						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F [Note 5]						-80.25	
	Bands FDD_G						-79.25	
	Bands FDD_H						-78.75	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	Bands FDD_A	RSRP_18
			Bands FDD_B1, FDD_B2	RSRP_19
			Bands FDD_C	RSRP_19
			Bands FDD_D	RSRP_20
			Bands FDD_E, FDD_F	RSRP_20
			Bands FDD_G	RSRP_21
			Bands FDD_H	RSRP_22
Highest reported value (Cell 2)	RSRP_42	RSRP_64	Bands FDD_A	RSRP_30
			Bands FDD_B1, FDD_B2	RSRP_31
			Bands FDD_C	RSRP_31
			Bands FDD_D	RSRP_32
			Bands FDD_E, FDD_F	RSRP_32
			Bands FDD_G	RSRP_33
			Bands FDD_D	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands FDD_A	RSRP_14
			Bands FDD_B1, FDD_B2	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands FDD_A	RSRP_35
			Bands FDD_B1, FDD_B2	RSRP_35
			Bands FDD_C	RSRP_36
			Bands FDD_D	RSRP_36
			Bands FDD_E, FDD_F	RSRP_37
			Bands FDD_G	RSRP_38
			Bands FDD_H	RSRP_38
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.1_2 FDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis

9.1.1.1_2.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.1.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.1.1.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.1.1_2.3-1: RSRP FDD Intra frequency absolute accuracy UE category 1bis

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±5.5	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1_2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1_2, clause 9.1.4 and A.9.1.1.

9.1.1.1_2.4 Test description

9.1.1.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.1_2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.1_2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.1.1_2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.1.1_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.1.1_2.5-2 as appropriate.

9.1.1.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.1_2.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.1_2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.1_2.5 Test requirement

Table 9.1.1.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1_2.5-3.

Table 9.1.1.1_2.5-1: Void

Table 9.1.1.1_2.5-2: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	115.0						115.5	
	Bands FDD_C						-115.0	
	Bands FDD_D						-114.5	
	Bands FDD_E Note 5, FDD_F						-114.0	
	Bands FDD_G						-113.0	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113.0	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112.0	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 5						-111.0	-114.2
	Bands FDD_G						-110.0	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 5						-80.25	
	Bands FDD_G						-79.25	
	Bands FDD_H						-78.75	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.1_2.5-3: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_28	RSRP_44	Bands FDD_A	RSRP_17
			Bands FDD_B	RSRP_18
			Bands FDD_C	RSRP_18
			Bands FDD_D	RSRP_19
			Bands FDD_E, FDD_F	RSRP_19
			Bands FDD_G	RSRP_20
			Bands FDD_H	RSRP_21
Highest reported value (Cell 2)	RSRP_43	RSRP_65	Bands FDD_A	RSRP_31
			Bands FDD_B	RSRP_32
			Bands FDD_C	RSRP_32
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_33
			Bands FDD_G	RSRP_34
			Bands FDD_D	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_41	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_68	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.1_3 FDD Intra Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements

9.1.1.1_3.1 Test purpose

To verify that the FDD intra frequency absolute RSRP measurement accuracy of the CA idle mode measurements is within the specified limit for all bands.

9.1.1.1_3.2 Test applicability

This test applies to E-UTRA FDD UE release 15 and forward capable of IDLE mode measurements for CA. This information is received from UECapabilityInformation.

9.1.1.1_3.3 Minimum conformance requirements

The UE shall measure the RSRP of the cell at the same frequency as the serving cell and the UE physical layer shall be capable of reporting RSRP measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.1.2B.2.

The accuracy requirements in Table 9.1.1.1_3.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [5] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.1.1 for a corresponding Band

Table 9.1.1.1_3.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±[6]	±[10.5]	≥[-4] dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±[9.5]	±[12.5]	≥[-4] dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_3.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1_3.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2B2, 9.1.3B.2 and 9.1.3B.3.

9.1.1.1_3.4 Test description

9.1.1.1_3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: According to TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.1_3.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the measured cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.1_3.4.2 Test procedure

1. System information combination 3 as defined in TS 36.508 [7] clause 4.4.3.1 is used in E-UTRA cells.
2. The UE is in state Generic RB Established (state 3) on Cell 1 according to TS 36.508 [7].
3. The SS transmits an RRCConnectionRelease message including the measIdleConfig on cell 1.
4. Wait for 30 s for the UE to enter E-UTRA RRC_IDLE state on Cell 1 and do measurements over cells 1 and 2.
5. The SS sends RRC Paging message with UE S-TMSI on the cell 1.
6. The UE shall transmit an RRCConnectionRequest message on the cell 1.
7. The SS transmits a RRCConnectionSetup message.
8. The UE shall transmit a RRCConnectionSetupComplete message with idleMeasAvailable.
9. The SS transmits a SecurityModeCommand message to activate AS security.
10. The UE shall transmit a SecurityModeComplete message.
11. The SS transmits a RRCConnectionReconfiguration message to establish the default bearer with condition SRB2-DRB(1, 0) .
12. The UE shall transmit an RRCConnectionReconfiguration complete message.
13. The SS transmits UEInformationRequest message with idleModeMeasurementReq included.
14. The UE shall transmit UEInformationResponse message including measResultListIdle.
15. SS shall check the RSRP value of Cell 1 and Cell 2 from measResultListIdle message. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to the Table 9.1.1.1_3.5.2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
16. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
17. Repeat step 1-16 for each sub-test in Table 9.1.1.1_3.4.5-2 as appropriate.

9.1.1.1_3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.1_3.4.3-1: *RRCConnectionRelease*

Derivation Path: 36.508 Table 4.6.1-15			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionRelease ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo	Not present		
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
measIdleConfig-r15	MeasIdleConfigDedicated-r15		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.1.1_3.4.3-2: *MeasIdleConfigDedicated-r15*

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasIdleConfigDedicated-r15 ::= SEQUENCE {			
measIdleCarrierListEUTRA-r15	EUTRA-CarrierList-r15		
measIdleDuration-r15	sec60		
}			

Table 9.1.1.1_3.4.3-3: EUTRA-CarrierList-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
EUTRA-CarrierList-r15 ::= SEQUENCE (	2 entries		
MeasIdleCarrierEUTRA-r15[1] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 1		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
MeasIdleCarrierEUTRA-r15[2] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 2		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
}			

Table 9.1.1.1_3.4.3-4: *RRCConnectionSetupComplete*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetupComplete ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetupComplete-r8 SEQUENCE {			
selectedPLMN-Identity	1		
registeredMME SEQUENCE {}	Not checked		
dedicatedInfoNAS SEQUENCE {}	Present but contents not checked		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
up-CIoT-EPS-Optimisation-r13	true		UP-CIoT
cp-CIoT-EPS-Optimisation-r13	true		CP-CIoT
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
idleMeasAvailable-r15	true	Value expected	
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.1.1_3.4.3-5: *UEInformationRequest*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationRequest-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationRequest-r9 SEQUENCE {			
rach-ReportReq-r9	FALSE		
rlf-ReportReq-r9	FALSE		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v930-IEs	
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1020-IEs	
logMeasReportReq-r10	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1130-IEs	
connEstFailReportReq-r11	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1250-IEs	
mobilityHistoryReportReq-r12	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1530-IEs	
idleModeMeasurementReq-r15	true		
flightPathInfoReq-r15 SEQUENCE {}	Not present		
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.1.1_3.4.3-6: *UEInformationResponse*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationResponse-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationResponse-r9 SEQUENCE {			
rach-Report-r9 SEQUENCE {}	Not checked		
rlf-Report-r9 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not checked		
nonCriticalExtension SEQUENCE {			
logMeasReport-r10 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {	Not checked		
connEstFailReport-r11 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
mobilityHistoryReport-r12 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
measResultListIdle-r15	MeasResultListIdle-r15		
flightPathInfoReport-r15	Not checked		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.1.1_3.4.3-7: MeasResultListIdle-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListIdle-r15::= SEQUENCE {	List Measurements		
MeasResultIdle-r15 SEQUENCE {	Cell 1 measurements		
measResultServingCell-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range,		
rsrqResult-r15	RSRQ-Range-r13		
}			
measResultNeighCells-r15 CHOICE {			
measResultIdleListEUTRA-r15 SEQUENCE {			
MeasResultIdleEUTRA-r15 SEQUENCE {			
carrierFreq-r15	ARFCN-ValueEUTRA-r9	Cell2 freq	
physCellId-r15			
measResult-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range		
rsrqResult-r15	RSRQ-Range-r13		
}			
}			
}			
}			
}			
}			

9.1.1.1_3.5 Test requirement

Table 9.1.1.1_3.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1_3.5-2.

Table 9.1.1.1_3.5-1: RSRP FDD Intra frequency absolute accuracy test parameters for CA idle mode measurements

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A Note 8	dBm/15 kHz	-97		-88		-116	
	Bands FDD_B1, FDD_B2 Note 9						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	0.54	-2.97	0.54	-2.97	0.69	-3.17
RSRP Note3	Bands FDD_A Note 8	dBm/15 kHz	-91	-93	-82	-84	-110	-112.2
	Bands FDD_B1, FDD_B2 Note 9						-109.5	-111.7
	Bands FDD_C						-109	-111.2
	Bands FDD_D						-108.5	-110.7
	Bands FDD_E, FDD_F Note 5						-108	-110.2
	Bands FDD_G Note 7						-107	-109.2
	Bands FDD_H						-106.5	-108.7
Io Note3	Bands FDD_A Note 8	dBm/9 MHz	-60.47		-51.47		-79.54	
	Bands FDD_B1, FDD_B2 Note 9						-79.04	
	Bands FDD_C						-78.54	
	Bands FDD_D						-78.04	
	Bands FDD_E, FDD_F Note 5						-77.54	
	Bands FDD_G Note 7						-76.54	
	Bands FDD_H						-76.04	

$\hat{E}_s / N_{oc}$	dB	6	4	6	4	6	3.8
Propagation condition	-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.
Note 7: Except Band 29.
Note 8: Except Band 32, Band 75, Band 76.
Note 9: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.1.1.1_3.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values for CA Idle mode measurements

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_42	RSRP_48	Bands FDD_A	RSRP_23
			Bands FDD_B	RSRP_24
			Bands FDD_C	RSRP_24
			Bands FDD_D	RSRP_25
			Bands FDD_E, FDD_F	RSRP_25
			Bands FDD_G	RSRP_26
			Bands FDD_H	RSRP_27
Highest reported value (Cell 2)	RSRP_54	RSRP_67	Bands FDD_A	RSRP_35
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_36
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_37
			Bands FDD_G	RSRP_38
			Bands FDD_D	RSRP_39
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_38	RSRP_45	Bands FDD_A	RSRP_19
			Bands FDD_B	RSRP_19
			Bands FDD_C	RSRP_20
			Bands FDD_D	RSRP_20
			Bands FDD_E, FDD_F	RSRP_21
			Bands FDD_G	RSRP_22
			Bands FDD_H	RSRP_22
Highest reported value (Cell 2)	RSRP_59	RSRP_70	Bands FDD_A	RSRP_40
			Bands FDD_B	RSRP_40
			Bands FDD_C	RSRP_41
			Bands FDD_D	RSRP_41
			Bands FDD_E, FDD_F	RSRP_42
			Bands FDD_G	RSRP_43
			Bands FDD_H	RSRP_43
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP

9.1.1.2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.1.1.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in table 9.1.1.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.1.2.3-1: RSRP FDD Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.1.

9.1.1.2.4 Test description

9.1.1.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.1.2.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.1.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.1.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.1.2.5-2 as appropriate.

9.1.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.2.4.3-2: *MeasResults*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.2.5 Test requirement

Table 9.1.1.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.1.2.5-3.

Table 9.1.1.2.5-1: Void

Table 9.1.1.2.5-2: RSRP FDD Intra frequency relative accuracy test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1		1		1		
$BW_{channel}$		MHz	10		10		10		
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-	
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0	
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-106.00	-106.00	-88.00	-88.00	-116.00		
	Bands FDD_B1, FDD_B2						-115.50		
	Bands FDD_E, FDD_F [Note 5]						-114.00		
	Bands FDD_H						-112.50		
	Bands FDD_D						-114.50		
	Bands FDD_G						-113.00		
	Bands FDD_C						-115.00		
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76	
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-100.00	-104.00	-82.00	-86.00	-113.00	-116.00	
	Bands FDD_B1, FDD_B2						-112.50	-115.50	
	Bands FDD_E, FDD_F [Note 5]						-111.00	-114.00	
	Bands FDD_H						-109.50	-112.50	
	Bands FDD_D						-111.50	-114.50	
	Bands FDD_G						-110.00	-113.00	
	Bands FDD_C						-112.00	-115.00	
Io[Note3]	Bands FDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20		
	Bands FDD_B1, FDD_B2						-81.70		
	Bands FDD_E, FDD_F [Note 5]						-80.20		
	Bands FDD_H						-78.70		
	Bands FDD_D						-80.70		
	Bands FDD_G						-79.20		
	Bands FDD_C						-81.20		
$\hat{E}_s / N_{oc}$		dB	6.00	2.00	6.00	2.00	3.00	0.00	
Propagation condition		-	AWGN		AWGN		AWGN		

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.2.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.2_2 FDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis

9.1.1.2_2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.1.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.1.1.2_2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in table 9.1.1.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.1.2_2.3-1: RSRP FDD Intra frequency relative accuracy UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2_2, clause 9.1.4 and A.9.1.1.

9.1.1.2_2.4 Test description

9.1.1.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.2_2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.2_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.1.2_2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.1.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.1.2_2.5-2 as appropriate.

9.1.1.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.2_2.4.3-1: Common Exception messages for RSRP FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.2_2.4.3-2: *MeasResults*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.2_2.5 Test requirement

Table 9.1.1.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.1.2_2.5-3.

Table 9.1.1.2_2.5-1: Void

Table 9.1.1.2_2.5-2: RSRP FDD Intra frequency relative accuracy test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-106.00	-106.00	-88.00	-88.00	-116.00	
	Bands FDD_B						-115.50	
	Bands FDD_E, FDD_F [Note 5]						-114.00	
	Bands FDD_H						-112.50	
	Bands FDD_D						-114.50	
	Bands FDD_G						-113.00	
	Bands FDD_C						-115.00	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-100.00	-104.00	-82.00	-86.00	-113.00	-116.00
	Bands FDD_B						-112.50	-115.50
	Bands FDD_E, FDD_F [Note 5]						-111.00	-114.00
	Bands FDD_H						-109.50	-112.50
	Bands FDD_D						-111.50	-114.50
	Bands FDD_G						-110.00	-113.00
	Bands FDD_C						-112.00	-115.00
Io[Note3]	Bands FDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_E, FDD_F [Note 5]						-80.20	
	Bands FDD_H						-78.70	
	Bands FDD_D						-80.70	
	Bands FDD_G						-79.20	
	Bands FDD_C						-81.20	
$\hat{E}_s / N_{oc}$		dB	6.00	2.00	6.00	2.00	3.00	0.00
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.2_2.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 10	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 10	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2 TDD Intra frequency RSRP Accuracy

9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy

9.1.2.1.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bit 16.

9.1.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.2.1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 2] / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.2.

9.1.2.1.4 Test description

9.1.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.2.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.2.1.5-3.

7 If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.1.5-2 as appropriate.

9.1.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.1.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.1.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

9.1.2.1.5 Test requirement

Table 9.1.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1.5-3.

Table 9.1.2.1.5-1: Void

Table 9.1.2.1.5-2: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands TDD_C						-115.0	
	Bands TDD_E						-114.0	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.1.5-3: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_28	RSRP_45	Bands TDD_A	RSRP_17
			Bands TDD_C	RSRP_18
			Bands TDD_E	RSRP_19
Highest reported value (Cell 2)	RSRP_43	RSRP_64	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands TDD_A	RSRP_35
			Bands TDD_C	RSRP_36
			Bands TDD_E	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.2.1_1.1 Test purpose

Same test purpose as in clause 9.1.2.1.1.

9.1.2.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.1.2.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.2.1_1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1_1, clause 9.1.4 and A.9.1.2.

9.1.2.1_1.4 Test description

9.1.2.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.2.1.4.1 with the following exceptions:

- Instead of 9.1.2.1.4.3 → use 9.1.2.1_1.4.3.

9.1.2.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.2.1.4.2 with the following exceptions:

- Instead of Table 9.1.2.1.5-2 → use Table 9.1.2.1_1.5-1.
- Instead of Table 9.1.2.1.5-3 → use Table 9.1.2.1_1.5-2.

9.1.2.1_1.4.3 Message contents

Same message contents as in clause 9.1.2.1.4.3

9.1.2.1_1.5 Test requirement

Table 9.1.2.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1_1.5-2.

Table 9.1.2.1_1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands TDD_C						-115.0	
	Bands TDD_E						-114.0	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.1_1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	Bands TDD_A	RSRP_18
			Bands TDD_C	RSRP_19
			Bands TDD_E	RSRP_20
Highest reported value (Cell 2)	RSRP_42	RSRP_64	Bands TDD_A	RSRP_30
			Bands TDD_C	RSRP_31
			Bands TDD_E	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands TDD_A	RSRP_35
			Bands TDD_C	RSRP_36
			Bands TDD_E	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.1_2 TDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis

9.1.2.1_2.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.2.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.1.2.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1_2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.2.1_2.3-1: RSRP TDD Intra frequency absolute accuracy UE category 1bis

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±5.5	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1_2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1_2, clause 9.1.4 and A.9.1.2.

9.1.2.1_2.4 Test description

9.1.2.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A. using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.2.1_2.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.1_2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.2.1_2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.2.1_2.5-3.
7. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.2.1_2.5-2 as appropriate.

9.1.2.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.1_2.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.1_2.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

9.1.2.1_2.5 Test requirement

Table 9.1.2.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1_2.5-3.

Table 9.1.2.1_2.5-1: Void

Table 9.1.2.1_2.5-2: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands TDD_C						-115.0	
	Bands TDD_E						-114.0	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.1_2.5-3: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_28	RSRP_44	Bands TDD_A	RSRP_17
			Bands TDD_C	RSRP_18
			Bands TDD_E	RSRP_19
Highest reported value (Cell 2)	RSRP_43	RSRP_65	Bands TDD_A	RSRP_31
			Bands TDD_C	RSRP_32
			Bands TDD_E	RSRP_33
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_41	Bands TDD_A	RSRP_13
			Bands TDD_C	RSRP_14
			Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_47	RSRP_68	Bands TDD_A	RSRP_36
			Bands TDD_C	RSRP_37
			Bands TDD_E	RSRP_38

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.2 TDD Intra Frequency Relative Accuracy of RSRP

9.1.2.2.1 Test purpose

To verify that the TDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.1.2.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.2.2.3-1: RSRP TDD Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.2.

9.1.2.2.4 Test description

9.1.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.2.2.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP measurement value for Cell 2 is compared to the reported RSRP measurement value for Cell 1 for each MeasurementReport message according to Table 9.1.2.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.2.5-2 as appropriate.

9.1.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.2.4.3-1: Common Exception messages for RSRP TDD intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.2.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	physCellId of Cell2		
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.2.2.5 Test requirement

Table 9.1.2.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.2.2.5-3. The mapping of measured quantity is defined in Table 9.1.2.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.2.5-1: Void

Table 9.1.2.2.5-2: RSRP TDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-106.0	-106.0	-88.0	-88.0	-116.0	
	Bands TDD_C						-115.00	
	Bands TDD_E						-114.00	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-100.0	-104.0	-82.0	-86.0	-113.0	-116.0
	Bands TDD_C						-112.00	-115.00
	Bands TDD_E						-111.00	-114.00
Io[Note4]	Bands TDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands TDD_C						-81.20	
	Bands TDD_E						-80.20	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	0.0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.2.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3		
	All bands	All bands	Bands 33, 34, 35, 36, 37, 38, 39, 40, 53	Band 42, 43, 48	Band 41
Normal Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
Extreme Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
RSRP_x is the reported value of Cell 1					

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.2_2 TDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis

9.1.2.2_2.1 Test purpose

To verify that the TDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.2.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.1.2.2_2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.2.2_2.3-1: RSRP TDD Intra frequency relative accuracy UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2_2, clause 9.1.4 and A.9.1.2.

9.1.2.2_2.4 Test description

9.1.2.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.2.2_2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.2_2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.2.2_2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP measurement value for Cell 2 is compared to the reported RSRP measurement value for Cell 1 for each MeasurementReport message according to Table 9.1.2.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.2_2.5-2 as appropriate.

9.1.2.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.2_2.4.3-1: Common Exception messages for RSRP TDD intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.2_2.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	physCellId of Cell2		
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.2.2_2.5 Test requirement

Table 9.1.2.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.2.2_2.5-3. The mapping of measured quantity is defined in Table 9.1.2.2_2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.2_2.5-1: Void

Table 9.1.2.2_2.5-2: RSRP TDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-106.0	-106.0	-88.0	-88.0	-116.0	
	Bands TDD_C						-115.00	
	Bands TDD_E						-114.00	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-100.0	-104.0	-82.0	-86.0	-113.0	-116.0
	Bands TDD_C						-112.00	-115.00
	Bands TDD_E						-111.00	-114.00
Io[Note4]	Bands TDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands TDD_C						-81.20	
	Bands TDD_E						-80.20	
$\hat{E}_s / N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	0.0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.2_2.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3		
	All bands	All bands	Bands 33, 34, 35, 36, 37, 38, 39, 40	Band 42, 43, 48	Band 41
Normal Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 10	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
Extreme Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 10	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
RSRP_x is the reported value of Cell 1					

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3 FDD Inter frequency RSRP Accuracy

9.1.3.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy

9.1.3.1.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.3.1.3-1: RSRP FDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.3.

9.1.3.1.4 Test description

9.1.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.3.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.3.1.5-3.

If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.3.1.5-2 as appropriate.

9.1.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1.4.3-1: Common Exception messages for RSRP FDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.1.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.1.5 Test requirement

Table 9.1.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1.5-3.

Table 9.1.3.1.5-1: Void

Table 9.1.3.1.5-2: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B1, FDD_B2					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands FDD_B1, FDD_B2					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B1, FDD_B2					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.1.5-3: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Bands FDD_A	RSRP_13
		Bands FDD_B1, FDD_B2	RSRP_13
		Bands FDD_C	RSRP_14
		Bands FDD_D	RSRP_14
		Bands FDD_E, FDD_F	RSRP_15
		Bands FDD_G	RSRP_16
		Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_71	Bands FDD_A	RSRP_28
		Bands FDD_B1, FDD_B2	RSRP_28
		Bands FDD_C	RSRP_29
		Bands FDD_D	RSRP_29
		Bands FDD_E, FDD_F	RSRP_30
		Bands FDD_G	RSRP_31
		Bands FDD_H	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands FDD_A	RSRP_10
		Bands FDD_B1, FDD_B2	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	RSRP_74	Bands FDD_A	RSRP_31
		Bands FDD_B1, FDD_B2	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.3.1_1.1 Test purpose

Same test purpose as in clause 9.1.3.1.1

9.1.3.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.3.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.3.1_1.3-1: RSRP FDD Inter frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3..
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1_1, clause 9.1.4 and A.9.1.3.

9.1.3.1_1.4 Test description

9.1.3.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.3.1.4.1 with the following exceptions:

- Instead of 9.1.3.1.4.3 → use 9.1.3.1_1.4.3.

9.1.3.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.3.1_1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.3.1_1.5-2.

9.1.3.1_1.4.3 Message contents

Same message contents as in clause 9.1.3.1.4.3

9.1.3.1_1.5 Test requirement

Table 9.1.3.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1_1.5-2.

Table 9.1.3.1_1.5-1: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B1, FDD_B2					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands FDD_B1, FDD_B2					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B1, FDD_B2					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52

	Bands FDD_H					-84.02
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.1_1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Bands FDD_A	RSRP_14
		Bands FDD_B1, FDD_B2	RSRP_15
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_16
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_18
Highest reported value (Cell 2)	RSRP_71	Bands FDD_A	RSRP_26
		Bands FDD_B1, FDD_B2	RSRP_27
		Bands FDD_C	RSRP_27
		Bands FDD_D	RSRP_28
		Bands FDD_E, FDD_F	RSRP_28
		Bands FDD_G	RSRP_29
		Bands FDD_H	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands FDD_A	RSRP_10
		Bands FDD_B1, FDD_B2	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	RSRP_74	Bands FDD_A	RSRP_31
		Bands FDD_B1, FDD_B2	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.1_2 FDD - FDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis

9.1.3.1_2.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.3.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.3.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.3.1_2.3-1: RSRP FDD Inter frequency absolute accuracy UE category 1bis

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±5.5	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1_2, clause 9.1.4 and A.9.1.3.

9.1.3.1_2.4 Test description

9.1.3.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.3.1_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.3.1_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.3.1_2.5-3.

   If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.3.1_2.5-2 as appropriate.

9.1.3.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1_2.4.3-1: Common Exception messages for RSRP FDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.1_2.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.1_2.5 Test requirement

Table 9.1.3.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1_2.5-3.

Table 9.1.3.1_2.5-1: Void

Table 9.1.3.1_2.5-2: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s / I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands FDD_B					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.1_2.5-3: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_51	Bands FDD_A	RSRP_13
		Bands FDD_B	RSRP_14
		Bands FDD_C	RSRP_14
		Bands FDD_D	RSRP_15
		Bands FDD_E, FDD_F	RSRP_15
		Bands FDD_G	RSRP_16
		Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_72	Bands FDD_A	RSRP_27
		Bands FDD_B	RSRP_28
		Bands FDD_C	RSRP_28
		Bands FDD_D	RSRP_29
		Bands FDD_E, FDD_F	RSRP_29
		Bands FDD_G	RSRP_30
		Bands FDD_H	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_48	Bands FDD_A	RSRP_9
		Bands FDD_B	RSRP_9
		Bands FDD_C	RSRP_10
		Bands FDD_D	RSRP_10
		Bands FDD_E, FDD_F	RSRP_11
		Bands FDD_G	RSRP_12
		Bands FDD_H	RSRP_12
Highest reported value (Cell 2)	RSRP_75	Bands FDD_A	RSRP_32
		Bands FDD_B	RSRP_32
		Bands FDD_C	RSRP_33
		Bands FDD_D	RSRP_33
		Bands FDD_E, FDD_F	RSRP_34
		Bands FDD_G	RSRP_35
		Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.1_3 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Overlapping Carrier

9.1.3.1_3.1 Test purpose

The purpose of this test is to verify that the FDD-FDD inter frequency absolute RSRP accuracy for CA idle mode measurements for overlapping carrier is within the specified limits.

9.1.3.1_3.2 Test applicability

The requirements in this clause are applicable for a UE:

- in state RRC_IDLE

- that is synchronised to the cell that is measured.

This test applies to E-UTRA FDD UE release 15 and forward capable of IDLE mode measurements for CA. This information is received from UECapabilityInformation.

9.1.3.1_3.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP of an overlapping carrier when Srxlev ≤ $S_{nonIntraSearchP}$ or Squal ≤ $S_{nonIntraSearchQ}$, in this clause, apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.3.1_3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.1.2 for a corresponding Band

Table 9.1.3.1_3-1: RSRP Inter frequency absolute accuracy for overlapping carrier

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±10.5	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9.5	±12.5	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.3.1_3.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.3.1_3.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3B.3.

9.1.3.1_3.4 Test description

9.1.3.1_3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: According to TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.1_3.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the measured cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1_3.4.2 Test procedure

1. System information combination 3 as defined in TS 36.508 [7] clause 4.4.3.1 is used in E-UTRA cells.
2. The UE is in state Generic RB Established (state 3) on Cell 1 according to TS 36.508 [7].
3. The SS transmits an RRCConnectionRelease message including the measIdleConfig on cell 1.
4. Wait for 30 s for the UE to enter E-UTRA RRC_IDLE state on Cell 1 and do measurements over cells 1 and 2.
5. The SS sends RRC Paging message with UE S-TMSI on the cell 1.
6. The UE shall transmit an RRCConnectionRequest message on the cell 1.
7. The SS transmits a RRCConnectionSetup message.
8. The UE shall transmit a RRCConnectionSetupComplete message with idleMeasAvailable.
9. The SS transmits a SecurityModeCommand message to activate AS security.
10. The UE shall transmit a SecurityModeComplete message.
11. The SS transmits a RRCConnectionReconfiguration message to establish the default bearer with condition SRB2-DRB(1, 0) .
12. The UE shall transmit an RRCConnectionReconfiguration complete message.
13. The SS transmits UEInformationRequest message with idleModeMeasurementReq included.
14. The UE shall transmit UEInformationResponse message including measResultListIdle.
15. SS shall check the RSRP value of Cell 1 and Cell 2 from measResultListIdle message. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to the Table 9.1.3.1_3.5.2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
16. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
17. Repeat step 1-16 for each sub-test in Table 9.1.3.1_3.4.5-2 as appropriate.

9.1.3.1_3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1_3.4.3-1: *RRCConnectionRelease*

Derivation Path: 36.508 Table 4.6.1-15			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionRelease ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo	Not present		
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
measIdleConfig-r15	MeasIdleConfigDedicated-r15		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_3.4.3-2: *MeasIdleConfigDedicated-r15*

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasIdleConfigDedicated-r15 ::= SEQUENCE {			
measIdleCarrierListEUTRA-r15	EUTRA-CarrierList-r15		
measIdleDuration-r15	sec60		
}			

Table 9.1.3.1_3.4.3-3: EUTRA-CarrierList-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
EUTRA-CarrierList-r15 ::= SEQUENCE (	2 entries		
MeasIdleCarrierEUTRA-r15[1] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 1		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
MeasIdleCarrierEUTRA-r15[2] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 2		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
}			

Table 9.1.3.1_3.4.3-4: *RRCConnectionSetupComplete*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetupComplete ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetupComplete-r8 SEQUENCE {			
selectedPLMN-Identity	1		
registeredMME SEQUENCE {}	Not checked		
dedicatedInfoNAS SEQUENCE {}	Present but contents not checked		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
up-CIoT-EPS-Optimisation-r13	true		UP-CIoT
cp-CIoT-EPS-Optimisation-r13	true		CP-CIoT
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
idleMeasAvailable-r15	true	Value expected	
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_3.4.3-5: *UEInformationRequest*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationRequest-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationRequest-r9 SEQUENCE {			
rach-ReportReq-r9	FALSE		
rlf-ReportReq-r9	FALSE		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v930-IEs	
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1020-IEs	
logMeasReportReq-r10	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1130-IEs	
connEstFailReportReq-r11	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1250-IEs	
mobilityHistoryReportReq-r12	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1530-IEs	
idleModeMeasurementReq-r15	true		
flightPathInfoReq-r15 SEQUENCE {}	Not present		
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_3.4.3-6: *UEInformationResponse*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationResponse-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationResponse-r9 SEQUENCE {			
rach-Report-r9 SEQUENCE {}	Not checked		
rlf-Report-r9 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not checked		
nonCriticalExtension SEQUENCE {			
logMeasReport-r10 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {	Not checked		
connEstFailReport-r11 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
mobilityHistoryReport-r12 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
measResultListIdle-r15	MeasResultListIdle-r15		
flightPathInfoReport-r15	Not checked		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_3.4.3-7: MeasResultListIdle-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListIdle-r15::= SEQUENCE {	List Measurements		
MeasResultIdle-r15 SEQUENCE {	Cell 1 measurements		
measResultServingCell-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range,		
rsrqResult-r15	RSRQ-Range-r13		
}			
measResultNeighCells-r15 CHOICE {			
measResultIdleListEUTRA-r15 SEQUENCE {			
MeasResultIdleEUTRA-r15 SEQUENCE {			
carrierFreq-r15	ARFCN-ValueEUTRA-r9	Cell2 freq	
physCellId-r15			
measResult-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range		
rsrqResult-r15	RSRQ-Range-r13		
}			
}			
}			
}			
}			
}			

9.1.3.1_3.5 Test requirement

Table 9.1.3.1_3.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD-FDD Inter frequency absolute accuracy test for CA idle mode measurements for non-overlapping carrier shall meet the reported values test requirements in table 9.1.3.1_3.5-2.

Table 9.1.3.1_3.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for CA idle mode measurements for overlapping carrier

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Bands FDD_A Note 8	dBm/15 kHz	-95.6	-95.6	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B1, FDD_B2 Note 9					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G Note 7					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Bands FDD_A Note 8	dBm/15 kHz	-85.6	-85.6	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands FDD_B1, FDD_B2 Note 9					-119.7
	Bands FDD_C					-119.2
	Bands FDD_D					-118.7
	Bands FDD_E, FDD_F Note 5					-118.2
	Bands FDD_G Note 7					-117.2
	Bands FDD_H					-116.7
Io Note3	Bands FDD_A Note 8	dBm/9 MHz	-57.4	-57.4	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B1, FDD_B2 Note 9					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G Note 7					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated, and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 7: Except Band 29.

Note 8: Except Band 32, Band 75, Band 76.

Note 9: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.1.3.1_3.5-2: RSRP FDD-FDD Inter frequency absolute accuracy requirements for the reported values for CA idle mode measurements for overlapping carriers

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_45	Bands FDD_A	RSRP_15
		Bands FDD_B	RSRP_16
		Bands FDD_C	RSRP_16
		Bands FDD_D	RSRP_17
		Bands FDD_E, FDD_F	RSRP_17
		Bands FDD_G	RSRP_18
		Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_66	Bands FDD_A	RSRP_27
		Bands FDD_B	RSRP_28
		Bands FDD_C	RSRP_28
		Bands FDD_D	RSRP_29
		Bands FDD_E, FDD_F	RSRP_29
		Bands FDD_G	RSRP_30
		Bands FDD_D	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_42	Bands FDD_A	RSRP_11
		Bands FDD_B	RSRP_11
		Bands FDD_C	RSRP_12
		Bands FDD_D	RSRP_12
		Bands FDD_E, FDD_F	RSRP_13
		Bands FDD_G	RSRP_14
		Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_69	Bands FDD_A	RSRP_32
		Bands FDD_B	RSRP_32
		Bands FDD_C	RSRP_33
		Bands FDD_D	RSRP_33
		Bands FDD_E, FDD_F	RSRP_34
		Bands FDD_G	RSRP_35
		Bands FDD_H	RSRP_35

9.1.3.1_4 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Non-Overlapping Carrier

9.1.3.1_4.1 Test purpose

The purpose of this test is to verify that the FDD-FDD inter frequency absolute RSRP accuracy for CA idle mode measurements for non-overlapping carrier is within the specified limits.

9.1.3.1_4.2 Test applicability

The requirements in this clause are applicable for a UE:

- in state RRC_IDLE

- that is synchronised to the cell that is measured.

This test applies to E-UTRA FDD UE release 15 and forward capable of IDLE mode measurements for CA. This information is received from UECapabilityInformation.

9.1.3.1_4.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP of an overlapping carrier when Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$, and a non-overlapping carrier in this clause, apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.3.1_4-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.1.2 for a corresponding Band

Table 9.1.3.1_4-1: RSRP Inter frequency absolute accuracy for overlapping and non-overlapping carrier

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±7	±11.5	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±10.5	±13.5	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.3.1_4.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.3.1_4.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3B.3.

9.1.3.1_4.4 Test description

9.1.3.1_4.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: According to TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.1_4.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the measured cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1_4.4.2 Test procedure

1. System information combination 3 as defined in TS 36.508 [7] clause 4.4.3.1 is used in E-UTRA cells.
2. The UE is in state Generic RB Established (state 3) on Cell 1 according to TS 36.508 [7].
3. The SS transmits an RRCConnectionRelease message including the measIdleConfig on cell 1.
4. Wait for 30 s for the UE to enter E-UTRA RRC_IDLE state on Cell 1 and do measurements over cells 1 and 2.
5. The SS sends RRC Paging message with UE S-TMSI on the cell 1.
6. The UE shall transmit an RRCConnectionRequest message on the cell 1.
7. The SS transmits a RRCConnectionSetup message.
8. The UE shall transmit a RRCConnectionSetupComplete message with idleMeasAvailable.
9. The SS transmits a SecurityModeCommand message to activate AS security.
10. The UE shall transmit a SecurityModeComplete message.
11. The SS transmits a RRCConnectionReconfiguration message to establish the default bearer with condition SRB2 DRB(1, 0) .
12. The UE shall transmit an RRCConnectionReconfiguration complete message.
13. The SS transmits UEInformationRequest message with idleModeMeasurementReq included.
14. The UE shall transmit UEInformationResponse message including measResultListIdle.
15. SS shall check the RSRP value of Cell 1 and Cell 2 from measResultListIdle message. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to the Table 9.1.3.1_4.5.2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
16. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
17. Repeat step 1-16 for each sub-test in Table 9.1.3.1_4.4.5-2 as appropriate.

9.1.3.1_4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1_4.4.3-1: *RRCConnectionRelease*

Derivation Path: 36.508 Table 4.6.1-15			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionRelease ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo	Not present		
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
measIdleConfig-r15	MeasIdleConfigDedicated-r15		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_4.4.3-2: *MeasIdleConfigDedicated-r15*

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasIdleConfigDedicated-r15 ::= SEQUENCE {			
measIdleCarrierListEUTRA-r15	EUTRA-CarrierList-r15		
measIdleDuration-r15	sec60		
}			

Table 9.1.3.1_4.4.3-3: EUTRA-CarrierList-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
EUTRA-CarrierList-r15 ::= SEQUENCE (	2 entries		
MeasIdleCarrierEUTRA-r15[1] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 1		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
MeasIdleCarrierEUTRA-r15[2] SEQUENCE {			
carrierFreq-r15	Same downlink EARFCN as used for Cell 2		
allowedMeasBandwidth-r15	mbw50	10 MHz carrier	
validityArea-r15	Not present		
measCellList-r15	Not present		
reportQuantities	both		
qualityThreshold-r15 SEQUENCE {			
idleRSRP-Threshold-r15	Not present		
idleRSRQ-Threshold-r15	Not present		
}			
}			
}			

Table 9.1.3.1_4.4.3-4: *RRCConnectionSetupComplete*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionSetupComplete ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionSetupComplete-r8 SEQUENCE {			
selectedPLMN-Identity	1		
registeredMME SEQUENCE {}	Not checked		
dedicatedInfoNAS SEQUENCE {}	Present but contents not checked		
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
up-CIoT-EPS-Optimisation-r13	true		UP-CIoT
cp-CIoT-EPS-Optimisation-r13	true		CP-CIoT
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
idleMeasAvailable-r15	true	Value expected	
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_4.4.3-5: *UEInformationRequest*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationRequest-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationRequest-r9 SEQUENCE {			
rach-ReportReq-r9	FALSE		
rlf-ReportReq-r9	FALSE		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v930-IEs	
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1020-IEs	
logMeasReportReq-r10	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1130-IEs	
connEstFailReportReq-r11	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1250-IEs	
mobilityHistoryReportReq-r12	Not present		
nonCriticalExtension SEQUENCE {		UEInformationRequest-v1530-IEs	
idleModeMeasurementReq-r15	true		
flightPathInfoReq-r15 SEQUENCE {}	Not present		
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_4.4.3-6: *UEInformationResponse*

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEInformationResponse-r9 ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-UL		
criticalExtensions CHOICE {			
c1 CHOICE{			
ueInformationResponse-r9 SEQUENCE {			
rach-Report-r9 SEQUENCE {}	Not checked		
rlf-Report-r9 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not checked		
nonCriticalExtension SEQUENCE {			
logMeasReport-r10 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {	Not checked		
connEstFailReport-r11 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
mobilityHistoryReport-r12 SEQUENCE {}	Not checked		
nonCriticalExtension SEQUENCE {			
measResultListIdle-r15	MeasResultListIdle-r15		
flightPathInfoReport-r15	Not checked		
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.1.3.1_4.4.3-7: MeasResultListIdle-r15

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListIdle-r15::= SEQUENCE {	List Measurements		
MeasResultIdle-r15 SEQUENCE {	Cell 1 measurements		
measResultServingCell-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range,		
rsrqResult-r15	RSRQ-Range-r13		
}			
measResultNeighCells-r15 CHOICE {			
measResultIdleListEUTRA-r15 SEQUENCE {			
MeasResultIdleEUTRA-r15 SEQUENCE {			
carrierFreq-r15	ARFCN-ValueEUTRA-r9	Cell2 freq	
physCellId-r15			
measResult-r15 SEQUENCE {			
rsrpResult-r15	RSRP-Range		
rsrqResult-r15	RSRQ-Range-r13		
}			
}			
}			
}			
}			
}			

9.1.3.1_4.5 Test requirement

Table 9.1.3.1_4.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD-FDD Inter frequency absolute accuracy test for CA idle mode measurements for non-overlapping carrier shall meet the reported values test requirements in table 9.1.3.1_4.5-2.

Table 9.1.3.1_4.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for CA idle mode measurements for non-overlapping carrier

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Bands FDD_A Note 8	dBm/15 kHz	-95.6	-95.6	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B1, FDD_B2 Note 9					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G Note 7					-114
	Bands FDD_H					-113.5
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Bands FDD_A Note 8	dBm/15 kHz	-85.6	-85.6	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands FDD_B1, FDD_B2 Note 9					-119.7
	Bands FDD_C					-119.2
	Bands FDD_D					-118.7
	Bands FDD_E, FDD_F Note 5					-118.2
	Bands FDD_G Note 7					-117.2
	Bands FDD_H					-116.7
Io Note3	Bands FDD_A Note 8	dBm/9 MHz	-57.4	-57.4	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B1, FDD_B2 Note 9					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G Note 7					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated, and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 7: Except Band 29.

Note 8: Except Band 32, Band 75, Band 76.

Note 9: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.1.3.1_4.5-2: RSRP FDD-FDD Inter frequency absolute accuracy requirements for the reported values for CA idle mode measurements for non-overlapping carriers

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_45	Bands FDD_A	RSRP_14
		Bands FDD_B	RSRP_15
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_16
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_18
Highest reported value (Cell 2)	RSRP_66	Bands FDD_A	RSRP_28
		Bands FDD_B	RSRP_29
		Bands FDD_C	RSRP_29
		Bands FDD_D	RSRP_30
		Bands FDD_E, FDD_F	RSRP_30
		Bands FDD_G	RSRP_31
		Bands FDD_D	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_42	Bands FDD_A	RSRP_10
		Bands FDD_B	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	RSRP_69	Bands FDD_A	RSRP_33
		Bands FDD_B	RSRP_33
		Bands FDD_C	RSRP_34
		Bands FDD_D	RSRP_34
		Bands FDD_E, FDD_F	RSRP_35
		Bands FDD_G	RSRP_36
		Bands FDD_H	RSRP_36

9.1.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP

9.1.3.2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.3.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.3.

9.1.3.2.4 Test description

9.1.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.3.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.3.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.3.2.5-2 as appropriate.

9.1.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.2.4.3-1: Common Exception messages for RSRP FDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.2.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.2.5 Test requirement

Table 9.1.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2.5-3.

Table 9.1.3.2.5-1: Void

Table 9.1.3.2.5-2: RSRP FDD - FDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands FDD_B1, FDD_B2					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands FDD_B1, FDD_B2					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands FDD_B1, FDD_B2					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total						

transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.2.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

9.1.3.2_1.1 Test purpose

Same test purpose as in clause 9.1.3.2.1.

9.1.3.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.3.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2_1.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.3.

9.1.3.2_1.4 Test description

9.1.3.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.3.2.4.1 with the following exceptions:

- Instead of 9.1.3.2.4.3 → use 9.1.3.2_1.4.3

9.1.3.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.3.2.4.2 with the following exceptions:

- Instead of Table 9.1.3.2.5-2 → use Table 9.1.3.2_1.5-1.
- Instead of Table 9.1.3.2.5-3 → use Table 9.1.3.2_1.5-2.

9.1.3.2_1.4.3 Message contents

Same message contents as in clause 9.1.3.2.4.3.

9.1.3.2_1.5 Test requirement

Table 9.1.3.2_1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2_1.5-3.

Table 9.1.3.2_1.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands FDD_B1, FDD_B2					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands FDD_B1, FDD_B2					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands FDD_B1, FDD_B2					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed

	to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.2_1.5-2: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 7)	RSRP_(x - 30)
Highest reported value (Cell 2)	RSRP_(x + 7)	RSRP_(x - 17)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis

9.1.3.2_2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.3.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.3.2_2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2_2.3-1: RSRP FDD Inter frequency relative accuracy UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±5.5	±7	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2_2, clause 9.1.4 and A.9.1.3.

9.1.3.2_2.4 Test description

9.1.3.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.3.2_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.2_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.3.2_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for

Cell 1 for each MeasurementReport message according to Table 9.1.3.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.3.2_2.5-2 as appropriate.

9.1.3.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.2_2.4.3-1: Common Exception messages for RSRP FDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.2_2.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.2_2.5 Test requirement

Table 9.1.3.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2_2.5-3.

Table 9.1.3.2_2.5-1: Void

Table 9.1.3.2_2.5-2: RSRP FDD - FDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands FDD_B					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s / I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands FDD_B					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands FDD_B					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.2_2.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 31)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 10)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 10)	RSRP_(x - 15)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4 TDD Inter frequency RSRP Accuracy

9.1.4.1 TDD - TDD Inter Frequency Absolute RSRP Accuracy

9.1.4.1.1 Test purpose

To verify that the TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.1.4.1.3-1: RSRP TDD-TDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1 , clause 9.1.4 and A.9.1.4.

9.1.4.1.4 Test description

9.1.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.4.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3 SS shall check the reported RSRP value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.4.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.1.5-2 as appropriate.

9.1.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.1.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.1.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.1.5 Test requirement

Table 9.1.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1.5-3.

Table 9.1.4.1.5-1: Void

Table 9.1.4.1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Bands TDD_A	RSRP_13
		Bands TDD_C	RSRP_14
		Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_71	Bands TDD_A	RSRP_28
		Bands TDD_C	RSRP_29
		Bands TDD_E	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	RSRP_74	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.1_1 TDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.4.1_1.1 Test purpose

Same test purpose as in clause 9.1.4.1.1

9.1.4.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.4.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.1.4.1_1.3-1: RSRP TDD-TDD Inter frequency absolute accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1 , clause 9.1.4 and A.9.1.4.

9.1.4.1_1.4 Test description

9.1.4.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.4.1.4.1 with the following exceptions:

- Instead of 9.1.4.1.4.3 → use 9.1.4.1_1.4.3.

9.1.4.1_1.4.2 Test procedure

The test shall be performed twice for TDD UL/DL configuration 1 and configuration 0 respectively.

Test procedures for TDD UL/DL configuration 1:

Same test procedure as in clause 9.1.4.1.4.2 with the following exceptions:

- Instead of Table 9.1.4.1.5-2 → use Table 9.1.4.1_1.5-1.
- Instead of Table 9.1.4.1.5-3 → use Table 9.1.4.1_1.5-3.

Test procedures for TDD UL/DL configuration 0:

Same test procedure as in clause 9.1.4.1.4.2 with the following exceptions:

- Instead of Table 9.1.4.1.5-2 → use Table 9.1.4.1_1.5-2.
- Instead of Table 9.1.4.1.5-3 → use Table 9.1.4.1_1.5-3.

9.1.4.1_1.4.3 Message contents

Same message contents as in clause 9.1.4.1.4.3 with following exceptions.

Table 9.1.4.1_1.4.3-1: *SystemInformationBlockType1* for TDD UL/DL configuration 0

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	Ssp6		
}			
}			

9.1.4.1_1.5 Test requirement

Table 9.1.4.1_1.5-1 and Table 9.1.4.1_1.5-2 define the primary level settings including test tolerances for all tests for TDD UL/DL configuration 1 and 0 respectively.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1_1.5-3.

Table 9.1.4.1_1.5-1: RSRP TDD-TDD Inter frequency absolute accuracy test parameters for TDD configuration 1

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51 dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and

noise at each receiver antenna port.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1_1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters for TDD configuration 0

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			0		0	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.5 TDD	-	R.5 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51 dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and

noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1_1.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_52	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_71	Bands TDD_A	RSRP_26
		Bands TDD_C	RSRP_27
		Bands TDD_E	RSRP_28
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	RSRP_74	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.1_2 TDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis

9.1.4.1_2.1 Test purpose

To verify that the TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.4.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.4.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.1.4.1_2.3-1: RSRP TDD-TDD Inter frequency absolute accuracy UE category 1bis

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±5.5	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1_2 , clause 9.1.4 and A.9.1.4.

9.1.4.1_2.4 Test description

9.1.4.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.4.1_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.1_2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.4.1_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3 SS shall check the reported RSRP value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.4.1_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.1_2.5-2 as appropriate.

9.1.4.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.1_2.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.1_2.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.1_2.5 Test requirement

Table 9.1.4.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1_2.5-3.

Table 9.1.4.1_2.5-1: Void

Table 9.1.4.1_2.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA [Note2]						
OCNG_RB [Note2]						
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s / I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1_2.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_51	Bands TDD_A	RSRP_13
		Bands TDD_C	RSRP_14
		Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_72	Bands TDD_A	RSRP_27
		Bands TDD_C	RSRP_28
		Bands TDD_E	RSRP_29
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_48	Bands TDD_A	RSRP_9
		Bands TDD_C	RSRP_10
		Bands TDD_E	RSRP_11
Highest reported value (Cell 2)	RSRP_75	Bands TDD_A	RSRP_32
		Bands TDD_C	RSRP_33
		Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRP

9.1.4.2.1 Test purpose

To verify that the TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.4.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2.3-1: RSRP TDD-TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.4.

9.1.4.2.4 Test description

9.1.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.4.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each

MeasurementReport message according to Table 9.1.4.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.2.5-2 as appropriate.

9.1.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.2.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.2.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.2.5 Test requirement

Table 9.1.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2.5-3. The mapping of measured quantity is defined in Table 9.1.4.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2.5-1: Void

Table 9.1.4.2.5-2: RSRP TDD-TDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA [Note2] OCNG_RB [Note2]		dB	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s / I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2.5-3: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2_1 TDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

9.1.4.2_1.1 Test purpose

Same test purpose as in clause 9.1.4.2.1.

9.1.4.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.4.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2_1.3-1: RSRP TDD-TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.4.

9.1.4.2_1.4 Test description

9.1.4.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.4.2.4.1 with the following exceptions:

- Instead of 9.1.4.2.4.3 → use 9.1.4.2_1.4.3.

9.1.4.2_1.4.2 Test procedure

Test shall be performed twice for TDD UL/DL configuration 1 and configuration 0 respectively.

Test procedures for TDD UL/DL configuration 1:

Same test procedure as in clause 9.1.4.2.4.2 with the following exceptions:

- Instead of Table 9.1.4.2.5-2 → use Table 9.1.4.2_1.5-1.
- Instead of Table 9.1.4.2.5-3 → use Table 9.1.4.2_1.5-3.

Test procedures for TDD UL/DL configuration 0:

Same test procedure as in clause 9.1.4.2.4.2 with the following exceptions:

- Instead of Table 9.1.4.2.5-2 → use Table 9.1.4.2_1.5-2.
- Instead of Table 9.1.4.2.5-3 → use Table 9.1.4.2_1.5-3.

9.1.4.2_1.4.3 Message contents

Same message contents as in clause 9.1.4.2.4.3 with following exceptions.

Table 9.1.4.2_1.4.3-1: *SystemInformationBlockType1* for TDD UL/DL configuration 0

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	Ssp6		
}			
}			

9.1.4.2_1.5 Test requirement

Table 9.1.4.2_1.5-1 and Table 9.1.4.2_1.5-2 define the primary level settings including test tolerances for all tests for TDD UL/DL configuration 1 and 0 respectively.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2_1.5-3. The mapping of measured quantity is defined in Table 9.1.4.2_1.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2_1.5-1: RSRP TDD-TDD Inter frequency relative accuracy test parameters for TDD configuration 1

Parameter	**Unit**	**Test 1**		**Test 2**	
		Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2_1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters for TDD configuration 0

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			0		0	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.5 TDD	-	R.5 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51 dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and

noise at each receiver antenna port. Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2_1.5-3: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 7)	RSRP_(x - 30)
Highest reported value (Cell 2)	RSRP_(x + 7)	RSRP_(x - 17)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis

9.1.4.2_2.1 Test purpose

To verify that the TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.4.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.4.2_2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2_2.3-1: RSRP TDD-TDD Inter frequency relative accuracy UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±5.5	±7	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2_2, clause 9.1.4 and A.9.1.4.

9.1.4.2_2.4 Test description

9.1.4.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.4.2_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.2_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.4.2_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each

MeasurementReport message according to Table 9.1.4.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. S shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.2_2.5-2 as appropriate.

9.1.4.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.2_2.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.2_2.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.2_2.5 Test requirement

Table 9.1.4.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2_2.5-3. The mapping of measured quantity is defined in Table 9.1.4.2_2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2_2.5-1: Void

Table 9.1.4.2_2.5-2: RSRP TDD-TDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51 dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2_2.5-3: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 31)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 10)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 10)	RSRP_(x - 15)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5 FDD - TDD Inter frequency RSRP Accuracy

9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy

9.1.5.1.1 Test purpose

To verify that the FDD - TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.5.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD from release 9 to release 11. Applicability requires support for FGI bit 25.

9.1.5.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.5.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.5.1.3-1: RSRP FDD - TDD Inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 2] / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.5.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.5.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.5.

9.1.5.1.4 Test description

9.1.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.5.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.5.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 as appropriate.

9.1.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.1.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.1.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.1.5 Test requirement

Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.5.1.5-3.

Table 9.1.5.1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-104	
$\hat{E}_s / I_{ot}$	dB	10		13	
RSRP Note3	dBm/15 kHz	-79.25		-91	
Io Note3	dBm/9 MHz	-51.05		-63.01	
$\hat{E}_s / N_{oc}$	dB	10		13	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112
$\hat{E}_s / I_{ot}$	dB	10	-3.2
RSRP[Note4]	dBm/15 kHz	-79.25	-115.2
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10	-3.2
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1.5-3: RSRP FDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_52	RSRP_18
Highest reported value (Cell 2)	RSRP_71	RSRP_33
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_49	RSRP_15
Highest reported value (Cell 2)	RSRP_74	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.1_1 FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.5.1_1.1 Test purpose

Same test purpose as in clause 9.1.5.1.1.

9.1.5.1_1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 12 and forward. Applicability requires support for FGI bit 25.

9.1.5.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.5.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.5.1_1.3-1: RSRP FDD - TDD Inter frequency absolute accuracy

Accuracy		**Conditions**			
			Io Note 1 **range**		
Normal condition	**Extreme condition**	**Ês/Iot**	**E-UTRA operating band groups** Note 3	**Minimum Io**		**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz** Note 2	**dBm/BW$_{Channel}$**	**dBm/BW$_{Channel}$**
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.5.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.5.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.5.

9.1.5.1_1.4 Test description

9.1.5.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.5.1.4.1 with the following exceptions:

- Instead of 9.1.5.1.4.3 → use 9.1.5.1_1.4.3.

9.1.5.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.5.1.4.2 with the following exceptions:

- Instead of Table 9.1.5.1.5-1 → use Table 9.1.5.1_1.5-1.
- Instead of Table 9.1.5.1.5-2 → use Table 9.1.5.1_1.5-2.
- Instead of Table 9.1.5.1.5-3 → use Table 9.1.5.1_1.5-3.

9.1.5.1_1.4.3 Message contents

Same message contents as in clause 9.1.5.1.4.3

9.1.5.1_1.5 Test requirement

Table 9.1.5.1_1.5-1 and Table 9.1.5.1_1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.5.1_1.5-3.

Table 9.1.5.1_1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1	Test 2
		Cell 1	Cell 1

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-104	
$\hat{E}_s / I_{ot}$	dB	10		13	
RSRP Note3	dBm/15 kHz	-79.25		-91	
Io Note3	dBm/9 MHz	-51.05		-63.01	
$\hat{E}_s / N_{oc}$	dB	10		13	
Propagation condition	-	AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2

E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112
$\hat{E}_s / I_{ot}$	dB	10	-3.2
RSRP[Note4]	dBm/15 kHz	-79.25	-115.2
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10	-3.2
Propagation condition	-	AWGN	AWGN

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_1.5-3: RSRP FDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_52	RSRP_19
Highest reported value (Cell 2)	RSRP_71	RSRP_31
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_49	RSRP_15
Highest reported value (Cell 2)	RSRP_74	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.1_2 FDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis

9.1.5.1_2.1 Test purpose

To verify that the FDD - TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.5.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.5.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.5.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.5.1_2.3-1: RSRP FDD - TDD Inter frequency absolute accuracy UE category 1bis

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±5.5	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.5.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.5.1_2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1_2, clause 9.1.4 and A.9.1.5.

9.1.5.1_2.4 Test description

9.1.5.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.5.1_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.1_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.5.1_2.5-1 and Table 9.1.5.1_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.5.1_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.5.1_2.5-1 and Table 9.1.5.1_2.5-2 as appropriate.

9.1.5.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.1_2.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.1_2.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.1_2.5 Test requirement

Table 9.1.5.1_2.5-1 and Table 9.1.5.1_2.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.5.1_2.5-3.

Table 9.1.5.1_2.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-104	
$\hat{E}_s / I_{ot}$	dB	10		13	
RSRP Note3	dBm/15 kHz	-79.25		-91	
Io Note3	dBm/9 MHz	-51.05		-63.01	
$\hat{E}_s / N_{oc}$	dB	10		13	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_2.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112
$\hat{E}_s / I_{ot}$	dB	10	-3.2
RSRP[Note4]	dBm/15 kHz	-79.25	-115.2
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10	-3.2
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_2.5-3: RSRP FDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_51	RSRP_18
Highest reported value (Cell 2)	RSRP_72	RSRP_32
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_48	RSRP_14
Highest reported value (Cell 2)	RSRP_75	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP

9.1.5.2.1 Test purpose

To verify that the FDD-TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.5.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD from release 9 to release 11. Applicability requires support for FGI bit 25.

9.1.5.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.5.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.5.2.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.5.

9.1.5.2.4 Test description

9.1.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.5.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each

MeasurementReport message according to Table 9.1.5.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 as appropriate.

9.1.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.2.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.2.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.2.5 Test requirement

Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.5.2.5-3.

Table 9.1.5.2.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-105.0	
$\hat{E}_s / I_{ot}$	dB	10.00		13.00	
RSRP Note3	dBm/15 kHz	-79.25		-92.00	
Io Note3	dBm/9 MHz	-51.05		-64.01	
$\hat{E}_s / N_{oc}$	dB	10.00		13.00	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112.00
$\hat{E}_s / I_{ot}$	dB	10.00	-3.20
RSRP[Note4]	dBm/15 kHz	-79.25	-115.20
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10.00	-3.20
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2.5-3: RSRP FDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x -9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.2_1 FDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

9.1.5.2_1.1 Test purpose

Same test purpose as in clause 9.1.5.2.1.

9.1.5.2_1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 12 and forward. Applicability requires support for FGI bit 25.

9.1.5.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.5.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.5.2_1.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.5.

9.1.5.2_1.4 Test description

9.1.5.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.5.2.4.1 with the following exceptions:

- Instead of 9.1.5.2.4.3 → use 9.1.5.2_1.4.3.

9.1.5.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.5.2.4.2 with the following exceptions:

- Instead of Table 9.1.5.2.5-1→ use Table 9.1.5.2_1.5-1.
- Instead of Table 9.1.5.2.5-2 → use Table 9.1.5.2_1.5-2.
- Instead of Table 9.1.5.2.5-3 → use Table 9.1.5.2_1.5-3.

9.1.5.2_1.4.3 Message contents

Same message contents as in clause 9.1.5.2.4.3.

9.1.5.2_1.5 Test requirement

Table 9.1.5.2_1.5-1 and Table 9.1.5.2_1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.5.2_1.5-3.

Table 9.1.5.2_1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-105	
$\hat{E}_s / I_{ot}$	dB	10.00		13.00	
RSRP Note3	dBm/15 kHz	-79.25		-92	
Io Note3	dBm/9 MHz	-51.05		-64.01	
$\hat{E}_s / N_{oc}$	dB	10.00		13.00	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112.00
$\hat{E}_s / I_{ot}$	dB	10.00	-3.20
RSRP[Note4]	dBm/15 kHz	-79.25	-115.20
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10.00	-3.20
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_1.5-3: RSRP FDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x -7)	RSRP_(x - 30)
Highest reported value (Cell 2)	RSRP_(x +7)	RSRP_(x - 17)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x -9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis

9.1.5.2_2.1 Test purpose

To verify that the FDD-TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.5.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16 and 25.

9.1.5.2_2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.5.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.5.2_2.3-1: RSRP FDD Inter frequency relative accuracy UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±5.5	±7	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2_2, clause 9.1.4 and A.9.1.5.

9.1.5.2_2.4 Test description

9.1.5.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.5.2_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.2_2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.5.2_2.5-1 and Table 9.1.5.2_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for

Cell 1 for each MeasurementReport message according to Table 9.1.5.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.5.2_2.5-1 and Table 9.1.5.2_2.5-2 as appropriate.

9.1.5.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.2_2.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.2_2.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.2_2.5 Test requirement

Table 9.1.5.2_2.5-1 and Table 9.1.5.2_2.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.5.2_2.5-3.

Table 9.1.5.2_2.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	dBm/15 kHz	-89.25		-105.0	
$\hat{E}_s / I_{ot}$	dB	10.00		13.00	
RSRP Note3	dBm/15 kHz	-79.25		-92.00	
Io Note3	dBm/9 MHz	-51.05		-64.01	
$\hat{E}_s / N_{oc}$	dB	10.00		13.00	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_2.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112.00
$\hat{E}_s / I_{ot}$	dB	10.00	-3.20
RSRP[Note4]	dBm/15 kHz	-79.25	-115.20
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s / N_{oc}$	dB	10.00	-3.20
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_2.5-3: RSRP FDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x – 8)	RSRP_(x – 31)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x – 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x – 10)	RSRP_(x – 33)
Highest reported value (Cell 2)	RSRP_(x + 10)	RSRP_(x – 15)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6 FDD RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier.

9.1.6.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.6.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.6.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.6.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.6.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.6

9.1.6.1.4 Test description

9.1.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.6.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.6.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.6.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.6.1.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1” and “Cell 2”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.6.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.6.1.5 Test requirement

Table 9.1.6.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.6.1.5-3.

Table 9.1.6.1.5-1: Void

Table 9.1.6.1.5-2: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.46	-5.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		

	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io[Note3]	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F [Note 6]		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
$\hat{E}_s / N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 10: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.6.1.5-3: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_12	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.1_1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.6.1_1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.6.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.6.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.6.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1_1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.6.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.6.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.6.

9.1.6.1_1.4 Test description

9.1.6.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.6.1.4.1 with the following exceptions:

- Instead of 9.1.6.1.4.3 → use 9.1.6.1_1.4.3.

9.1.6.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.6.1_1.5-1.
- Instead of Table 9.1.6.1.5-3 → use Table 9.1.6.1_1.5-2.

9.1.6.1_1.4.3 Message contents

Same message contents as in clause 9.1.6.1.4.3.

9.1.6.1_1.5 Test requirement

Table 9.1.6.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.6.1_1.5-2.

Table 9.1.6.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.46	-5.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		

$\hat{E}_s / N_{oc}$	dB	-4	3	-1
Propagation condition	-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 10: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.6.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42

Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and FDD relative RSRP accuracy between the secondary component carriers.

9.1.6.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.6.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.6.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.6.2.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.6.2.3-2 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.6.2.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.6.

9.1.6.2.4 Test description

9.1.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.6.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.6.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.6.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.6.2.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.6.2.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1-2” and “Cell 2-3”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.6.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.6.2.5 Test requirement

Table 9.1.6.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.6.2.5-3.

Table 9.1.6.2.5-1: Void

Table 9.1.6.2.5-2: RSRP FDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.09	-4.96
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		

	Bands FDD_H		-84.26		
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.					
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.					
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.					
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz					
Note 7: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands.					
Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.					
Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.					
Note 10: E-UTRA operating band groups are as defined in Section 3.5.					

Table 9.1.6.2.5-3: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.6.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.6.2.1.

9.1.6.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.6.2_1.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.6.2_1.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

- RSRP1,2|$_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
  - | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.6.2_1.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.6.2_1.3-2 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2|$_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.6.2_1.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.6.

9.1.6.2_1.4 Test description

9.1.6.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.6.2.4.1.

9.1.6.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.6.2_1.5-1.
- Instead of Table 9.1.6.2.5-3 → use Table 9.1.6.2_1.5-2.

9.1.6.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.6.2.4.3.

9.1.6.2_1.5 Test requirement

Table 9.1.6.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.6.2_1.5-2.

Table 9.1.6.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.09	-4.96
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		

$\hat{E}_s / N_{oc}$	dB	-4	3	-0.2
Propagation condition	-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz
Note 7: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 10: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.6.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7 TDD RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier.

9.1.7.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.7.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.7.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.7.1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.7.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.7.

9.1.7.1.4 Test description

9.1.7.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.7.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.7.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.7.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.7.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

Different events may require different times for a verdict.
If both events ("Cell 1" and "Cell 2") pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.7.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.7.1.5 Test requirement

Table 9.1.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.7.1.5-2.

Table 9.1.7.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.46	-5.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s / N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.1_1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.7.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.7.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.7.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.7.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.7.1_1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 2] / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.7.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.7.

9.1.7.1_1.4 Test description

9.1.7.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.7.1.4.1 with the following exceptions:

- Instead of 9.1.7.1.4.3 → use 9.1.7.1_1.4.3.

9.1.7.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.7.1_1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.7.1_1.5-2.

9.1.7.1_1.4.3 Message contents

Same message contents as in clause 9.1.7.1.4.3

9.1.7.1_1.5 Test requirement

Table 9.1.7.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.7.1_1.5-2.

Table 9.1.7.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.46	-5.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s / N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise

at each receiver antenna port.
NOTE 6: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
NOTE 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)	RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)	RSRP_34	RSRP_35	RSRP_36
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and TDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.7.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.7.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.8 for a corresponding Band

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.7.2.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.7.2.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

9.1.7.2.4 Test description

9.1.7.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.7.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.7.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.7.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.7.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.7.2.5-2. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1-2” and “Cell 2-3”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.7.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.7.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.7.2.5 Test requirement

Table 9.1.7.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.7.2.5-2.

Table 9.1.7.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.2_1 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.7.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.7.2.1.

9.1.7.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.7.2_1.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2_1.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band
- $\left|RSRP1|_{dBm} - RSRP2|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.7.2_1.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2_1.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.7.2_1.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

9.1.7.2_1.4 Test description

9.1.7.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.7.2.4.1.

9.1.7.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.4.2-1 → use Table 9.1.7.2_1.5-1.
- Instead of Table 9.1.7.2.4.2-2 → use Table 9.1.7.2_1.5-2.

9.1.7.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.7.2.4.2.

9.1.7.2_1.5 Test requirement

Table 9.1.7.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.7.2_1.5-2.

Table 9.1.7.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s / I_{ot}$		dB	-4.00	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s / N_{oc}$		dB	-4+TT	3	-0.2
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211 [9].

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions.

9.1.8.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11. Applicability requires support for FGI bit 115.

9.1.8.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.8.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.8

9.1.8.1.4 Test description

9.1.8.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.8.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.8.1.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'10000000100000001000 00001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'10000000100000001000 00001000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'01000000010000000100 00001000000001000000'	Configured for measurements on Cell 1.

9.1.8.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.8.1.4.1-1 and Table 9.1.8.1.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRP.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.8.1.4.1-1 and Table 9.1.8.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 2 are compared to the actual RSRP values according to Table 9.1.8.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.8.1.5-1 as appropriate.

9.1.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.8.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.8.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.8.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.8.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.8.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.8.1.5 Test requirement

Table 9.1.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.8.1.5-2.

Table 9.1.8.1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2.00	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.54	-85.16
	Bands FDD_B1, FDD_B2						-81.04	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.8.1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_B1, FDD_B2	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B1, FDD_B2	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_30
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8.1_1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)

9.1.8.1_1.1 Test purpose

Same test purpose as in clause 9.1.8.1.1.

9.1.8.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 115.

9.1.8.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.8.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by $\Delta>0$, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.8

9.1.8.1_1.4 Test description

9.1.8.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.8.1.4.1.

9.1.8.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.8.1.4.2 with the following exceptions:

- Instead of Table 9.1.8.1.5-1→ use Table 9.1.8.1_1.5-1.
- Instead of Table 9.1.8.1.5-2→ use Table 9.1.8.1_1.5-2.

9.1.8.1_1.4.3 Message contents

Same message contents as in clause 9.1.8.1.4.3.

9.1.8.1_1.5 Test requirement

Table 9.1.8.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.8.1_1.5-2.

Table 9.1.8.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.5 (OP.5 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G Note 9						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G Note 9						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.63+ TT	-85.37+ TT
	Bands FDD_B1, FDD_B2						-81.04	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G Note 9						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66

Propagation condition		AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: Except Band 29 and Band 32.

Table 9.1.8.1_1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_26	RSRP_40	Bands FDD_A	RSRP_15
			Bands FDD_B1, FDD_B2	RSRP_16
			Bands FDD_C	RSRP_16
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_17
			Bands FDD_G	RSRP_18
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_39	RSRP_59	Bands FDD_A	RSRP_27
			Bands FDD_B1, FDD_B2	RSRP_28
			Bands FDD_C	RSRP_28
			Bands FDD_D	RSRP_29
			Bands FDD_E, FDD_F	RSRP_29
			Bands FDD_G	RSRP_30
			Bands FDD_H	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8.2 FDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation condition.

9.1.8.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.1.8.2.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.8.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.10 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 3 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4 , clause 9.1.4 and A.9.1.8

9.1.8.2.4 Test description

9.1.8.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.8.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.8.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.8.2.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 !=0$	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'10000000100000001000000010000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'10000000100000001000000010000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'01000000010000000100000001000000010000000'	Configured for measurements on Cell 1.

9.1.8.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.8.2.4.1-1 and Table 9.1.8.2.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 1 and Cell 2 are both measured.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.8.2.4.1-1 and Table 9.1.8.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.8.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.8.2.5-1 as appropriate.

9.1.8.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.8.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.8.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.8.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.8.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.8.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.8.2.5 Test requirement

Table 9.1.8.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.8.2.5-2.

Table 9.1.8.2.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.20	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.30	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands FDD_B1, FDD_B2						-81.04	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.8.2.5-2: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions.

9.1.9.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11. Applicability requires support for FGI bit 115.

9.1.9.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.9.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.9

9.1.9.1.4 Test description

9.1.9.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.9.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.9.1.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.1.9.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.9.1.4.1-1 and Table 9.1.9.1.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRP.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.9.1.4.1-1 and Table 9.1.9.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 2 are compared to the actual RSRP values according to Table 9.1.9.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.9.1.5-1 as appropriate.

9.1.9.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.9.1.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.9.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.9.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.9.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.9.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.9.1.5 Test requirement

Table 9.1.9.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.9.1.5-2.

Table 9.1.9.1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2.00	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9.1_1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)

9.1.9.1_1.1 Test purpose

Same test purpose as in clause 9.1.9.1.1.

9.1.9.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 115.

9.1.9.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.9.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.9

9.1.9.1_1.4 Test description

9.1.9.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.9.1.4.1.

9.1.9.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.8.1.4.2 with the following exceptions:

- Instead of Table 9.1.8.1.5-1→ use Table 9.1.8.1_1.5-1.
- Instead of Table 9.1.8.1.5-2→ use Table 9.1.8.1_1.5-2.

9.1.9.1_1.4.3 Message contents

Same message contents as in clause 9.1.9.1.4.3.

9.1.9.1_1.5 Test requirement

Table 9.1.9.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.9.1_1.5-2.

Table 9.1.9.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-76.59	-0.75	-6.59
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.

Note 7: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.1_1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_26	RSRP_40	Bands TDD_A	RSRP_15
			Bands TDD_C	RSRP_16
			Bands TDD_E	RSRP_17
Highest reported value (Cell 2)	RSRP_39	RSRP_59	Bands TDD_A	RSRP_27
			Bands TDD_C	RSRP_28
			Bands TDD_E	RSRP_29
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9.2 TDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation condition.

9.1.9.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.1.9.2.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.9.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.10 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4 , clause 9.1.4 and A.9.1.9

9.1.9.2.4 Test description

9.1.9.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.9.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.9.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.9.2.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.1.9.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.9.2.4.1-1 and Table 9.1.9.2.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 1 and Cell 2 are both measured.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.9.2.4.1-1 and Table 9.1.9.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.9.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.9.2.5-1 as appropriate.

9.1.9.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.9.2.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.9.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.9.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.9.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.9.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.9.2.5 Test requirement

Table 9.1.9.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the reported values test requirements in table 9.1.9.2.5-2.

Table 9.1.9.2.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.30	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.2.5-2: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy.

9.1.10.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.10.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 2] range			
			E-UTRA operating band groups [Note 4]	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz [Note 1, 3]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.10.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.10.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.10

9.1.10.1.4 Test description

9.1.10.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.10.1.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.10.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.1.10.1.5-1 and 9.1.10.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.10.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.10.1.5-2 as appropriate.

9.1.10.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.10.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.10.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.10.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.10.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'00010000000100000001 00000001000000010000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.10.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.10.1.4.3-6: *SystemInformationBlockType2*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.1.10.1.4.3-7: *SystemInformationBlockType3*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.10.1.5 Test requirement

Table 9.1.10.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.10.1.5-3.

Table 9.1.10.1.5-1: General test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 = 0$, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'01000000100000001000000000100000001000000'	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'01000000100000001000000000100000001000000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'00010000000100000001000000001000000010000'	Configured for measurements on Cell 1.

Table 9.1.10.1.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) Note5			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2,						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2,						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands FDD_B1, FDD_B2,						-81.13	-84.87
	Bands FDD_C						-80.63	-84.37
	Bands FDD_D						-80.13	-83.87
	Bands FDD_E, FDD_F Note 8						-79.63	-83.37

	Bands FDD_G						-78.63	-82.37
	Bands FDD_H						-78.13	-81.87
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-85.16
	Bands FDD_B1, FDD_B2,						-81.13	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 8						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.

Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] clause 9.1.2.3 and 9.1.2.4.

Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.10.1.5-3: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_B1, FDD_B2,	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B1, FDD_B2,	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_30
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2,	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2,	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10.1_1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)

9.1.10.1_1.1 Test purpose

Same test purpose as in clause 9.1.10.1.1.

9.1.10.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.10.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 2] range			
			E-UTRA operating band groups [Note 4]	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz [Note 1, 3]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2,	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B1, , FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.10.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.10.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.10.

9.1.10.1_1.4 Test description

9.1.10.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.10.1.4.1.

9.1.10.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.10.1.4.2 with the following exceptions:

- Instead of Table 9.1.10.1.5-1→ use Table 9.1.10.1_1.5-1.
- Instead of Table 9.1.10.1.5-2→ use Table 9.1.10.1_1.5-2.
- Instead of Table 9.1.10.1.5-3→ use Table 9.1.10.1_1.5-3.

9.1.10.1_1.4.3 Message contents

Same message contents as in clause 9.1.10.1.4.3.

9.1.10.1_1.5 Test requirement

Table 9.1.10.1_1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.10.1_1.5-3.

Table 9.1.10.1_1.5-1: General test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'01000000100000001000 00000010000001000000'	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'01000000100000001000 00000010000001000000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'00010000000100000001 00000001000000010000'	Configured for measurements on Cell 1.

Table 9.1.10.1_1.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.8 (OP.8 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2,						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G Note 10						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	3.05	5	-3.05
CRS $(\hat{E}_s / Iot)_{meas}$ Note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $(\hat{E}_s / Iot)_{meas}$ Note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2,						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.05
	Bands FDD_G Note 10						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands FDD_B1, FDD_B2,						-81.13	-84.87
	Bands FDD_C						-80.63	-84.37
	Bands FDD_D						-80.13	-83.87

	Bands FDD_E, FDD_F Note 8						-79.63	-83.37
	Bands FDD_G Note 10						-78.63	-82.37
	Bands FDD_H						-78.13	-81.87
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-86.47
	Bands FDD_B1, FDD_B2,						-81.04	-85.97
	Bands FDD_C						-80.54	-85.47
	Bands FDD_D						-80.04	-84.97
	Bands FDD_E, FDD_F Note 8						-79.54	-84.47
	Bands FDD_G Note 10						-78.54	-83.47
	Bands FDD_H						-78.04	-82.97
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.2.1-1.

Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.

Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Except Band 29 and Band 32.

Table 9.1.10.1_1.5-3: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_26	RSRP_40	Bands FDD_A	RSRP_15
			Bands FDD_B1, FDD_B2,	RSRP_16
			Bands FDD_C	RSRP_16
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_17
			Bands FDD_G	RSRP_18
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_39	RSRP_59	Bands FDD_A	RSRP_27
			Bands FDD_B1, FDD_B2,	RSRP_27
			Bands FDD_C	RSRP_28
			Bands FDD_D	RSRP_28
			Bands FDD_E, FDD_F	RSRP_29
			Bands FDD_G	RSRP_29
			Bands FDD_H	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2,	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2,	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10.2 FDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements.

9.1.10.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.4.

The accuracy requirements in Table 9.1.10.2.3-1 for relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex I.3.1 for a corresponding Band

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.10.

9.1.10.2.4 Test description

9.1.10.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.10.2.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.10.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.1.10.2.5-1 and 9.1.10.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.10.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.10.2.5-2 as appropriate.

9.1.10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.10.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.10.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.10.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.10.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'00010000000100000001 00000001000000010000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.10.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.10.2.4.3-6: *SystemInformationBlockType2*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.1.10.2.4.3-7: *SystemInformationBlockType3*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.10.2.5 Test requirement

Table 9.1.10.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.10.2.5-3.

Table 9.1.10.2.5-1: General test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 =0$, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'01000000100000001000 00000010000001000000'	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'01000000100000001000 00000010000001000000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'00010000000100000001 00000001000000010000'	Configured for measurements on Cell 1.

Table 9.1.10.2.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) Note5			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$\left(\mathrm{Io}\right)_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.3	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands FDD_B1, FDD_B2						-81.04	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 8						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66

$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-71.30	-75.77	-53.54	-58.47	-81.54	-86.47
	Bands FDD_B1, FDD_B2						-81.04	-85.97
	Bands FDD_C						-80.54	-85.47
	Bands FDD_D						-80.04	-84.97
	Bands FDD_E, FDD_F Note 8						-79.54	-84.47
	Bands FDD_G						-78.54	-83.47
	Bands FDD_H						-78.04	-82.97
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.

Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] clause 9.1.2.3 and 9.1.2.4.

Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.10.2.5-3: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy.

9.1.11.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.11.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by $\Delta>0$, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.11.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.11.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.11

9.1.11.1.4 Test description

9.1.11.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.11.1.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.11.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.11.1.5-1 and 9.1.11.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.11.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.1.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.11.1.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.11.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.11.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.11.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.11.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.11.1.4.3-6: *SystemInformationBlockType2*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.1.11.1.4.3-7: *SystemInformationBlockType3*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.11.1.5 Test requirement

Table 9.1.11.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.11.1.5-3.

Table 9.1.11.1.5-1: General test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 =0$, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.1.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands TDD_C						-80.63	-84.37
	Bands TDD_E						-79.63	-83.37
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.11.1.5-3: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11.1_1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)

9.1.11.1_1.1 Test purpose

Same test purpose as in clause 9.1.11.1.1.

9.1.11.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.11.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.11.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.11.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.11.

9.1.11.1_1.4 Test description

9.1.11.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.11.1.4.1.

9.1.11.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.11.1.4.2 with the following exceptions:

- Instead of Table 9.1.11.1.5-1→ use Table 9.1.11.1_1.5-1.
- Instead of Table 9.1.11.1.5-2→ use Table 9.1.11.1_1.5-2.
- Instead of Table 9.1.11.1.5-3→ use Table 9.1.11.1_1.5-3.

9.1.11.1_1.4.3 Message contents

Same message contents as in clause 9.1.11.1.4.3.

9.1.11.1_1.5 Test requirement

Table 9.1.11.1_1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.11.1_1.5-3.

Table 9.1.11.1_1.5-1: General test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.1_1.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands TDD_C						-80.63	-84.37
	Bands TDD_E						-79.63	-83.37
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7:	In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.11.1_1.5-3: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_26	RSRP_40	Bands TDD_A	RSRP_15
			Bands TDD_C	RSRP_16
			Bands TDD_E	RSRP_17
Highest reported value (Cell 2)	RSRP_39	RSRP_59	Bands TDD_A	RSRP_27
			Bands TDD_C	RSRP_28
			Bands TDD_E	RSRP_29
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11.2 TDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements.

9.1.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.4.

The accuracy requirements in Table 9.1.11.2.3-1 for relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex I.3.1 for a corresponding Band

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.11.

9.1.11.2.4 Test description

9.1.11.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.11.2.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.11.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.11.2.5-1 and 9.1.11.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.11.2.5-3.

If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.1.11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.11.2.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.11.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.11.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.11.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.11.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.11.2.4.3-6: *SystemInformationBlockType2*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.1.11.2.4.3-7: *SystemInformationBlockType3*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.11.2.5 Test requirement

Table 9.1.11.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.11.2.5-3.

Table 9.1.11.2.5-1: General test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 ,clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.2.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s / Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands TDD_C						-80.63	-84.37
	Bands TDD_E						-79.63	-83.37
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.30	-76.09	-53.54	-58.76	-81.54	-86.47
	Bands TDD_C						-80.54	-85.47
	Bands TDD_E						-79.54	-84.47
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.11.2.5-3: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier under bandwidth of 20MHz.

9.1.12.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.12.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.12.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.12.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.12.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.12

9.1.12.1.4 Test description

9.1.12.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.12.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.12.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.12.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.12.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass (“Cell 1” and “Cell 2”), the test passes ofr each configuration (without and with switched PCell/SCell scenario). If one event fails, the test fails.

9.1.12.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.12.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.12.1.5 Test requirement

Table 9.1.12.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.12.1.5-2.

Table 9.1.12.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2 Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.6.1.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.12.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_12	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.12.1_1.1 Test purpose

Same test purpose as in clause 9.1.12.1.1.

9.1.12.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.12.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.12.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.12.1_1.3-1: RSRP FDD absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.12.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.12.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.12.

9.1.12.1_1.4 Test description

9.1.12.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.12.1.4.1 with the following exceptions:

- Instead of 9.1.12.1.4.3 → use 9.1.12.1_1.4.3.

9.1.12.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.12.1.4.2 with the following exceptions:

- Instead of Table 9.1.12.1.5-1 → use Table 9.1.12.1_1.5-1.
- Instead of Table 9.1.12.1.5-2 → use Table 9.1.12.1_1.5-2.

9.1.12.1_1.4.3 Message contents

Same message contents as in clause 9.1.12.1.4.3.

9.1.12.1_1.5 Test requirement

Table 9.1.12.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.12.1_1.5-2.

Table 9.1.12.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2 Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.6.1.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.12.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and FDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.12.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.12.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.12.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.12.2.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The requirements in Table 9.1.12.2.3-2 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.12.2.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.12.

9.1.12.2.4 Test description

9.1.12.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.12.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.12.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.12.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.12.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.12.2.5-2. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If both events ("Cell 1-2" and "Cell 2-3") pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.12.2.4.3 Message contents

Table 9.1.12.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.12.2.5 Test requirement

Table 9.1.12.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.12.2.5-2.

Table 9.1.12.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2 Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.6.2.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.12.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1+TT
Highest reported value (Cell 2)	RSRP_x + 17+TT
Lowest reported value (Cell 3)	RSRP_y – 8+TT
Highest reported value (Cell 3)	RSRP_y + 1+TT
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.2_1FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.12.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.12.2.1.

9.1.12.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.12.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.6.2_1.3.

9.1.12.2_1.4 Test description

9.1.12.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.12.2.4.1.

9.1.12.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.12.2.4.2 with the following exceptions:

- Instead of Table 9.1.12.2.5-1 → use Table 9.1.12.2_1.5-1.
- Instead of Table 9.1.12.2.5-2 → use Table 9.1.12.2_1.5-2.

9.1.12.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.12.2.4.3.

9.1.12.2_1.5 Test requirement

Table 9.1.12.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.12.2_1.5-2.

Table 9.1.12.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell 3

$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2 Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.6.2.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.12.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x +2
Highest reported value (Cell 2)	RSRP_x +15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13 TDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier under bandwidth of 20MHz.

9.1.13.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.13.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.13.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.13.1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.13.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.13.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1,clause 9.1.11.2 clause 9.1.4 and A.9.1.13.

9.1.13.1.4 Test description

9.1.13.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.13.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.13.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.13.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.13.1.5-2. This counts respectively as a Pass or Fail for the events "Cell 1" and "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event "Cell 2" is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1" and "Cell 2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.1.13.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.13.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.13.1.5 Test requirement

Table 9.1.13.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.13.1.5-2.

Table 9.1.13.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.13.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.13.1_1.1 Test purpose

Same test purpose as in clause 9.1.13.1.1

9.1.13.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.13.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.13.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.13.1_1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.13.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.13.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1,clause 9.1.11.2 clause 9.1.4 and A.9.1.13.

9.1.13.1_1.4 Test description

9.1.13.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.13.1.4.1 with the following exceptions:

- Instead of 9.1.13.1.4.3 → use 9.1.13.1_1.4.3.

9.1.13.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.13.1.4.2 with the following exceptions:

- Instead of Table 9.1.13.1.5-1 → use Table 9.1.13.1_1.5-1.
- Instead of Table 9.1.13.1.5-2 → use Table 9.1.13.1_1.5-2.

9.1.13.1_1.4.3 Message contents

Same message contents as in clause 9.1.13.1.4.3

9.1.13.1_1.5 Test requirement

Table 9.1.13.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.13.1_1.5-2.

Table 9.1.13.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		
[NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.] NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.13.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)	RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)	RSRP_34	RSRP_35	RSRP_36
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and TDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.13.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.13.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.13.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band

$$\left| RSRP1\big|_{dBm} - RSRP2\big|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.13.2.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4 and A.9.1.13.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.13.2.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.13.2.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, 9.1.11.3, clause 9.1.4 and A.9.1.13.

9.1.13.2.4 Test description

9.1.13.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.13.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.13.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.13.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.13.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.13.2.5-2. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.1.13.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.13.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.13.2.5 Test requirement

Table 9.1.13.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.13.2.5-2.

Table 9.1.13.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.13.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.13.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.13.2.1.

9.1.13.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.13.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.13.2_1.4 Test description

9.1.13.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.13.2.4.1 with the following exceptions:

- Instead of Table 9.1.13.2.5-1 → use Table 9.1.13.2_1.5-1.
- Instead of Table 9.1.13.2.5-2 → use Table 9.1.13.2_1.5-2.

9.1.13.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.13.2.4.2.

9.1.13.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.13.2.4.3.

9.1.13.2_1.5 Test requirement

Table 9.1.13.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.13.2_1.5-2.

Table 9.1.13.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.1.13.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14 FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Editor's note: This test case is incomplete for E-UTRA bands belonging to bands group FDD_B

- E-UTRA bands group FDD_B1, FDD_B2 in this test case has not yet been updated in section 3.5

- Test tolerances are missing from FDD_B1, FDD_B2

9.1.14.1.1 Test purpose

To verify that the Absolute RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.14.1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11. Applicability requires support of FGI bit 115.

9.1.14.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.14.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.14.

9.1.14.1.4 Test description

9.1.14.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.14.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.14.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.14.1.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
DRX				OFF
Cell 2 time offset with respect to Cell 1			0μs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 μs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'10000000100000001000000010000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the PCell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'01000000010000000100000001000000010000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.14.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.14.1.4.1-1 and Table 9.1.14.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.14.1.4.1-1 and Table 9.1.14.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.14.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.14.1.5-1 as appropriate.

9.1.14.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.14.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.14.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.14.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.14.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.14.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.14.1.5 Test requirement

Table 9.1.14.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.14.1.5-2.

Table 9.1.14.1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_B1, FDD_B2								-115.5		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F [Note 7]								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP [Note3,4,5]	Bands FDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-119
	Bands FDD_B1, FDD_B2								-111.5+TT	-113.5+TT	-119.5+TT
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F [Note 7]								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5
$(\mathrm{Io})_{meas}$ [Note 3,5]	Bands FDD_A	dBm/9 MHz	-70.58	-74.43		-52.74	-56.83		-80.74	-84.83	
	Bands FDD_B1, FDD_B2								-80.32+TT	-84.54+TT	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	

	Bands FDD_E, FDD_F Note 7						-78.74	-82.83
	Bands FDD_G						-77.74	-81.83
	Bands FDD_H						-77.24	-81.33
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in TS 36.133Section 3.5.

Table 9.1.14.1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_B1, FDD_B2	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 3)	RSRP_41	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B1, FDD_B2	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_31
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_33
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14.1_1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)

9.1.14.1_1.1 Test purpose

Same test purpose as in clause 9.1.14.1.1.

9.1.14.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 12 and forward. Applicability requires support of FGI bit 115.

9.1.14.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.14.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD B1, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.14.

9.1.14.1_1.4 Test description

9.1.14.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.14.1.4.1.

9.1.14.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.14.1.4.2 with the following exceptions:

- Instead of Table 9.1.14.1.5-1→ use Table 9.1.14.1_1.5-1.
- Instead of Table 9.1.14.1.5-2→ use Table 9.1.14.1_1.5-2.

9.1.14.1_1.4.3 Message contents

Same message contents as in clause 9.1.14.1.4.3.

9.1.14.1_1.5 Test requirement

Table 9.1.14.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.14.1_1.5-2.

Table 9.1.14.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter	Unit	Test 1			Test 2			Test 3		
		Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell

E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in A.3.2.1.5 (OP.5 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP. FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_B1, FDD_B2								-115.5		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G Note 9								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.4
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-11
	Bands FDD_B1, FDD_B2								-111.5	-113.5	-118.
	Bands FDD_C								-111	-113	-11
	Bands FDD_D								-110.5	-112.5	-117.
	Bands FDD_E, FDD_F Note 7								-110	-112	-11
	Bands FDD_G Note 9								-109	-111	-11
	Bands FDD_H								-108.5	-110.5	-115.
$(\mathrm{Io})_{meas}$ Note 3,5	Bands FDD_A	dBm/9 MHz	-70.58 +TT	-74.43+TT		-52.82+ TT	-57.04+TT		-80.74	-84.83	
	Bands FDD_B1, FDD_B2								-80.24	-84.33	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	
	Bands FDD_E, FDD_F Note 7								-78.74	-82.83	
	Bands FDD_G Note 9								-77.74	-81.83	
	Bands FDD_H								-77.24	-81.33	

Propagation condition		AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameter themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: Except Band 29 and Band 32.

Table 9.1.14.1_1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_27	RSRP_40	Bands FDD_A	RSRP_15
			Bands FDD_B1, FDD_B2	RSRP_16
			Bands FDD_C	RSRP_16
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_17
			Bands FDD_G	RSRP_18
			Bands FDD_H	RSRP_19
Highest reported value (Cell 3)	RSRP_39	RSRP_59	Bands FDD_A	RSRP_28
			Bands FDD_B1, FDD_B2	RSRP_28
			Bands FDD_C	RSRP_29
			Bands FDD_D	RSRP_29
			Bands FDD_E, FDD_F	RSRP_30
			Bands FDD_G	RSRP_31
			Bands FDD_H	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B1, FDD_B2	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B1, FDD_B2	RSRP_33
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Editor's note: This test case is incomplete for E-UTRA bands belonging to bands group FDD_B

- E-UTRA bands group FDD_B1, FDD_B2 in this test case has not yet been updated in section 3.5

- Test tolerances are missing from FDD_B1, FDD_B2

9.1.14.2.1 Test purpose

To verify that the Relative RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.14.2.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.1.14.2.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.14.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by $\Delta>0$, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.14.

9.1.14.2.4 Test description

9.1.14.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.14.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.14.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.14.2.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
DRX				OFF
Cell 2 time offset with respect to Cell 1			0μs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 μs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'10000000100000001000000010000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the PCell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'01000000010000000100000001000000010000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.14.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.14.2.4.1-1 and Table 9.1.14.2.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.14.2.4.1-1 and Table 9.1.14.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.14.2.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.14.2.5-1 as appropriate.

9.1.14.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.14.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.14.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.14.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.14.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100000001000000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.14.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000000010000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.14.2.5 Test requirement

Table 9.1.14.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.14.2.5-2.

Table 9.1.14.2.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_B1, FDD_B2								-115.5		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F [Note 7]								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	-1.41	-0.77	-5.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP [Note3,4,5]	Bands FDD_A	dBm/15 kHz	-102	-104	-106.5	-84	-86	-91	-112	-114	-119
	Bands FDD_B1, FDD_B2								-111.5+TT	-113.5+TT	-119.5+TT
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F [Note 7]								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5
$(\mathrm{Io})_{meas}$ [Note 3,5]	Bands FDD_A	dBm/9 MHz	70.45	-74.11		52.74	-56.83		-80.74	-84.83	
	Bands FDD_B1, FDD_B2								-80.32+TT	-84.54+TT	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	

	Bands FDD_E, FDD_F Note 7						-78.74	-82.83
	Bands FDD_G						-77.74	-81.83
	Bands FDD_H						-77.24	-81.33
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in TS 36.133Section 3.5.

Table 9.1.14.2.5-2: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-8	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-2	RSRP_x-3	RSRP_x-3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-9	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-1	RSRP_x-3	RSRP_x-3
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15 TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.1.1 Test purpose

To verify that the Absolute RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.15.1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11. Applicability requires support of FGI bit 115.

9.1.15.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.15.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	TDD_A	-121	N/A	-70
			TDD_C	-120	N/A	-70
			TDD_E	-119	N/A	-70
±8	±11	≥-4 dB	TDD_A, TDD_C, TDD_E	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.15.

9.1.15.1.4 Test description

9.1.15.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.15.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.15.1.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX				OFF
Cell 2 time offset with respect to Cell 1			0μs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 μs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 before the measurements start.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'10000000001000000000'	Configured for Cell 1 measurements.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.15.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.15.1.4.1-1 and Table 9.1.15.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance

information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.15.1.4.1-1 and Table 9.1.15.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.15.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.15.1.5-1 as appropriate.

9.1.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.15.1.4.3-1: Common Exception messages for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.15.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.15.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 3	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.15.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 9.1.15.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.15.1.5 Test requirement

Table 9.1.15.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.15.1.5-2.

Table 9.1.15.1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA		dB	Note 6		0	Note 6		0	Note 6		0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note1											
OCNG_RB Note1											
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106			-88			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{Io})_{meas}$ Note 3, 5	Bands TDD_A	dBm/9 MHz	-70.58	-74.43		-52.74	-56.83		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition			AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 3)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 3)	RSRP_41	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E, FDD_F	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15.1_1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)

9.1.15.1_1.1 Test purpose

Same test purpose as in clause 9.1.15.1.1.

9.1.15.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 12 and forward. Applicability requires support of FGI bit 115.

9.1.15.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.15.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	$\hat{E}s/Iot$	Io Note 2 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.15.

9.1.15.1_1.4 Test description

9.1.15.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.15.1.4.1.

9.1.15.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.15.1.4.2 with the following exceptions:

- Instead of Table 9.1.15.1.5-1→ use Table 9.1.15.1_1.5-1
- Instead of Table 9.1.15.1.5-2→ use Table 9.1.15.1_1.5-2

9.1.15.1_1.4.3 Message contents

Same message contents as in clause 9.1.15.1.4.3.

9.1.15.1_1.5 Test requirement

Table 9.1.15.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.15.1_1.5-2.

Table 9.1.15.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.6 (OP.6 TDD)			OP.5 TDD	OP.6 TDD	OP.6 TDD	OP.5 TDD	OP.6 TDD	OP.6 TDD	OP.5 TDD	OP.6 TDD	OP. TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6		0	Note 6		0	Note 6		0
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-106			-88			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.4
RSRP [Note3,4,5]	Bands TDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-11
	Bands TDD_C								-111	-113	-11
	Bands TDD_E								-110	-112	-11
$(\mathrm{Io})_{meas}$ [Note 3, 5]	Bands TDD_A	dBm/9 MHz	-70.58	-74.43		-52.74	-56.83		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	

Propagation condition		AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameter themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.1_1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_27	RSRP_40	Bands TDD_A	RSRP_15
			Bands TDD_C	RSRP_16
			Bands TDD_E	RSRP_17
Highest reported value (Cell 3)	RSRP_39	RSRP_59	Bands TDD_A	RSRP_28
			Bands TDD_C	RSRP_29
			Bands TDD_E, FDD_F	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.2.1 Test purpose

To verify that the Relative RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.15.2.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.1.15.2.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.15.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 3 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	TDD_A	-121	-50
			TDD_C	-120	-50
			TDD_E	-119	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by $\Delta>0$, when applicable, as described in TS 36.133 [4] Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.15.

9.1.15.2.4 Test description

9.1.15.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.15.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.15.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.15.2.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX				OFF
Cell 2 time offset with respect to Cell 1			0μs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 μs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 before the measurements start.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'10000000001000000000'	Configured for Cell 1 measurements.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.15.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.15.2.4.1-1 and Table 9.1.15.2.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance

information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.15.2.4.1-1 and Table 9.1.15.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.15.2.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.15.2.5-1 as appropriate.

9.1.15.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.15.2.4.3-1: Common Exception messages for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.15.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.15.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 3	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.15.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 9.1.15.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.15.2.5 Test requirement

Table 9.1.15.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the reported values test requirements in table 9.1.15.2.5-2.

Table 9.1.15.2.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA		dB	Note 6		0	Note 6		0	Note 6		0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note1											
OCNG_RB Note1											
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106			-88			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-102	-104	-106.5	-84	-86	-91	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{Io})_{meas}$ Note 3, 5	Bands TDD_A	dBm/9 MHz	-70.45	-74.11		-52.74	-56.83		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition			AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.2.5-2: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 3)	RSRP_x-8	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-2	RSRP_x-3	RSRP_x-3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-9	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-1	RSRP_x-3	RSRP_x-3
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16 FDD Intra frequency RSRP Accuracy for 5MHz Bandwidth

9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth

9.1.16.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for bands within band group FDD_N.

9.1.16.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support bands within band group FDD_N. Applicability requires support for FGI bit 16.

9.1.16.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.16.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.16.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in section 3.5.1.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.16.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.16.

9.1.16.1.4 Test description

9.1.16.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.1.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.16.1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.16.1.5-2.

9.1.16.1.4.3 Message contents

Same message contents as defined in clause 9.1.1.1.4.3.

9.1.16.1.5 Test requirement

Table 9.1.16.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.16.1.5-2.

Table 9.1.16.1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_N	dBm/15 kHz	-104		-84		-109.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Bands FDD_N	dBm/15 kHz	-98.0	-102.0	-78.0	-82.0	-106.5	-109.7
Io[Note3]	Bands FDD_N	dBm/4.5 MHz	-71.06		-51.06		-78.76	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values for 5MHz bandwidth

Normal Conditions	Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	RSRP_31	RSRP_49	RSRP_23
Highest reported value (Cell 2)	RSRP_46	RSRP_68	RSRP_38
Extreme Conditions	**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	RSRP_28	RSRP_46	RSRP_20
Highest reported value (Cell 2)	RSRP_49	RSRP_71	RSRP_41

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)

9.1.16.1_1.1 Test purpose

Same test purpose as in clause 9.1.16.1.1.

9.1.16.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support bands within band group FDD_N. Applicability requires support for FGI bit 16.

9.1.16.1_1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.16.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.16.1_1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in section 3.5.1.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.16.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.16.

9.1.16.1_1.4 Test description

9.1.16.1_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.1_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.16.1_1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.16.1_1.5-2.

9.1.16.1_1.4.3 Message contents

Same message contents as defined in clause 9.1.1.1.4.3.

9.1.16.1_1.5 Test requirement

Table 9.1.16.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.16.1_1.5-2.

Table 9.1.16.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_N	dBm/15 kHz	-104		-84		-109.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Bands FDD_N	dBm/15 kHz	-98.0	-102.0	-78.0	-82.0	-106.5	-109.7
Io[Note3]	Bands FDD_N	dBm/4.5 MHz	-71.06		-51.06		-78.76	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values for 5MHz bandwidth

Normal Conditions	Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	RSRP_32	RSRP_49	RSRP_25
Highest reported value (Cell 2)	RSRP_45	RSRP_68	RSRP_37
Extreme Conditions	**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	RSRP_28	RSRP_46	RSRP_20
Highest reported value (Cell 2)	RSRP_49	RSRP_71	RSRP_41

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth

9.1.16.2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for bands within band group FDD_N.

9.1.16.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support bands within band group FDD_N. Applicability requires support for FGI bit 16.

9.1.16.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.16.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.16.2.3-1: RSRP Intra frequency relative accuracy

Accuracy		**Conditions**			
Normal condition	**Extreme condition**	**Ês/Iot** Note 2	**Io** Note 1 **range**		
			E-UTRA operating band groups Note 5	**Minimum Io**	**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz** Note 4	**dBm/BW$_{Channel}$**
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.16.

9.1.16.2.4 Test description

9.1.16.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.2.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.2.4.2 with the following exceptions:

- Instead of Table 9.1.1.2.5-2 → use Table 9.1.16.2.5-1.
- Instead of Table 9.1.1.2.5-3 → use Table 9.1.16.2.5-2.

9.1.16.2.4.3 Message contents

Same message contents as defined in clause 9.1.1.2.4.3.

9.1.16.2.5 Test requirement

Table 9.1.16.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.16.2.5-2.

Table 9.1.16.2.5-1: RSRP FDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands FDD_N	dBm/15 kHz	-103		-84		-109.5	
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note3]	Bands FDD_N	dBm/15 kHz	-97.0	-101.0	-78.0	-82.0	-106.5	-109.5
Io[Note3]	Bands FDD_N	dBm/4.5 MHz	-70.06		-51.06		-78.71	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.2.5-2: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17 FDD Inter frequency RSRP Accuracy for 5MHz Bandwidth

9.1.17.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth

9.1.17.1.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy for 5MHz Bandwidth is within the specified limit.

9.1.17.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.1.17.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.17.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.17.1-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.17.

9.1.17.1.4 Test description

9.1.17.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.1.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.17.1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.17.1.5-2.

9.1.17.1.4.3 Message contents

Same message contents as defined in clause 9.1.3.1.4.3.

9.1.17.1.5 Test requirement

Table 9.1.17.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.17.1.5-2.

Table 9.1.17.1.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0	0
N_{oc} Note2	Cell 2: Bands FDD_N	dBm/15 kHz	-86.25	-86.25	-102.5	-110.5
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Bands FDD_N	dBm/15 kHz	-76.25	-76.25	-89.5	-113.7
Io Note3	Cell 2: Bands FDD_N	dBm/4.5 MHz	-51.06	-51.06	-64.52	-84.03
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.

Note 7: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N.

Table 9.1.17.1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values, 5MHz Bandwidth

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_55	Cell 2: Bands FDD_N	RSRP_19
Highest reported value (Cell 2)	RSRP_74	Cell 2: Bands FDD_N	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Cell 2: Bands FDD_N	RSRP_16
Highest reported value (Cell 2)	RSRP_77	Cell 2: Bands FDD_N	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)

Editor's notes: This test case is incomplete. The following item is missing or incomplete:

- Test requirements for Test2 in normal conditions are TBD.

9.1.17.1_1.1 Test purpose

Same test purpose as in clause 9.1.17.1.1.

9.1.17.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.1.17.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.17.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.17.1_1.3-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 2] / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70

±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.17.

9.1.17.1_1.4 Test description

9.1.17.1_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.1_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.17.1_1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.17.1_1.5-2.

9.1.17.1_1.4.3 Message contents

Same message contents as defined in clause 9.1.3.1.4.3.

9.1.17.1_1.5 Test requirement

Table 9.1.17.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.17.1_1.5-2.

Table 9.1.17.1_1.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Cell 2: Bands FDD_N	dBm/15 kHz	-86.25	-86.25	-102.5	-110.5
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Bands FDD_N	dBm/15 kHz	-76.25	-76.25	-89.5	-113.7
Io Note3	Cell 2: Bands FDD_N	dBm/4.5 MHz	-51.06	-51.06	-64.52	-84.03
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
NOTE 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
NOTE 7: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N.

Table 9.1.17.1_1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values, 5MHz Bandwidth

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_55	Cell 2: Bands FDD_N	TBD
Highest reported value (Cell 2)	RSRP_74	Cell 2: Bands FDD_N	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Cell 2: Bands FDD_N	RSRP_16
Highest reported value (Cell 2)	RSRP_77	Cell 2: Bands FDD_N	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth

9.1.17.2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for bands within band group FDD_N.

9.1.17.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.1.17.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.17.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.17.2.3-1: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in section 3.5.1.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.17.

9.1.17.2.4 Test description

9.1.17.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.2.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.2.4.2 with the following exceptions:

- Instead of Table 9.1.3.2.5-2 → use Table 9.1.17.2.5-1.
- Instead of Table 9.1.3.2.5-3 → use Table 9.1.17.2.5-2.

9.1.17.2.4.3 Message contents

Same message contents as defined in clause 9.1.3.2.4.3.

9.1.17.2.5 Test requirement

Table 9.1.17.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.17.2.5-2.

Table 9.1.17.2.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters for 5MHz bandwidth

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Cell 2: Bands FDD_N	dBm/15 kHz	-86.25	-86.25	-103.50	-110.50
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Bands FDD_N	dBm/15 kHz	-76.25	-76.25	-90.50	-113.70
Io Note3	Cell 2: Bands FDD_N	dBm/4.5 MHz	-51.06	-51.06	-65.52	-84.03
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.

Note 7: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.

Table 9.1.17.2.5-2: RSRP FDD Inter frequency relative accuracy requirements for the 5MHz bandwidth for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth (Rel-12 and forward)

Editor's notes: This test case is incomplete. The following item is missing or incomplete:

- Test requirements for Test 1 and 2 in normal conditions are TBD

9.1.17.2_1.1 Test purpose

Same test purpose as in clause 9.1.17.2.1.

9.1.17.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.1.17.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.17.2_1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.17.2_1.3-1: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in section 3.5.1.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.17.

9.1.17.2_1.4 Test description

9.1.17.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.17.2.4.1.

9.1.17.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.17.2.4.2 with the following exceptions:

- Instead of Table 9.1.17.2.5-1 → use Table 9.1.17.2_1.5-1.
- Instead of Table 9.1.17.2.5-2 → use Table 9.1.17.2_1.5-2.

9.1.17.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.17.2.4.3.

9.1.17.2_1.5 Test requirement

Table 9.1.17.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.17.2_1.5-2.

Table 9.1.17.2_1.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters for 5MHz bandwidth

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Cell 2: Bands FDD_N	dBm/15 kHz	-86.25	-86.25	-103.50	-110.50
$\hat{E}_s / I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Bands FDD_N	dBm/15 kHz	-76.25	-76.25	-90.50	-113.70
Io Note3	Cell 2: Bands FDD_N	dBm/4.5 MHz	-51.06	-51.06	-65.52	-84.03
$\hat{E}_s / N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.

Note 7: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.

Table 9.1.17.2_1.5-2: RSRP FDD Inter frequency relative accuracy requirements for the 5MHz bandwidth for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz

9.1.18.1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.18.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 supporting CA.

9.1.18.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1.3.

9.1.18.1.4 Test description

9.1.18.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.18.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.18.1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.18.1.5-1.
- Instead of Table 9.1.6.1.5-3 → use Table 9.1.18.1.5-2.

9.1.18.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.18.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.18.1.5 Test requirement

Table 9.1.18.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.18.1.5-2.

Table 9.1.18.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io^{Note2}	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-2 for the other parameters.

Table 9.1.18.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42

Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.1_1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The test tolerances applicable to this test are undefined

9.1.18.1_1.1 Test purpose

Same test purpose as in clause 9.1.18.1.1.

9.1.18.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.18.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1_1.3.

9.1.18.1_1.4 Test description

9.1.18.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.18.1.4.1 with the following exceptions:

- Instead of 9.1.18.1.4.3 → use 9.1.18.1_1.4.3.

9.1.18.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.18.1.4.2 with the following exceptions:

- Instead of Table 9.1.18.1.5-1 → use Table 9.1.18.1_1.5-1.
- Instead of Table 9.1.18.1.5-2 → use Table 9.1.18.1_1.5-2.

9.1.18.1_1.4.3 Message contents

Same message contents as in clause 9.1.18.1.4.3.

9.1.18.1_1.5 Test requirement

Table 9.1.18.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.18.1_1.5-2.

Table 9.1.18.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell 3

$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io^{Note2}	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.1.5-2 for the other parameters.					

Table 9.1.18.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz

9.1.18.2.1 Test purpose

Same test purpose as in clause 9.1.6.2.1.

9.1.18.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 supporting CA.

9.1.18.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2.3.

9.1.18.2.4 Test description

9.1.18.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.18.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.18.2.4.2 Test procedure

Same test procedure as in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.18.2.5-1.
- Instead of Table 9.1.6.2.5-3 → use Table 9.1.18.2.5-2.

9.1.18.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.18.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.18.2.5 Test requirement

Table 9.1.18.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.18.2.5-2.

Table 9.1.18.2.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.2.5-2 for the other parameters.					

Table 9.1.18.2.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

9.1.18.2_1.1 Test purpose

Same test purpose as in clause 9.1.18.2.1.

9.1.18.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.18.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2_1.3.

9.1.18.2_1.4 Test description

9.1.18.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.18.2.4.1.

9.1.18.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.18.2.4.2 with the following exceptions:

- Instead of Table 9.1.18.2.5-1 → use Table 9.1.18.2_1.5-1.
- Instead of Table 9.1.18.2.5-2 → use Table 9.1.18.2_1.5-2.

9.1.18.2_1.4.3 Message contents

Same message contents as in clause 9.1.18.2.4.3

9.1.18.2_1.5 Test requirement

Table 9.1.18.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.18.2_1.5-2.

Table 9.1.18.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
	Bands FDD_N		N/A		
RSRP Note2	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
	Bands FDD_N		N/A		
Io Note2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.5dB)	
	Bands FDD_B1, FDD_B2				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
	Bands FDD_N			-80.94	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.2.5-2 for the other parameters.

Table 9.1.18.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x +2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz

9.1.19.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.19.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 supporting CA.

9.1.19.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.2.

9.1.19.1.4 Test description

9.1.19.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.19.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.19.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.19.1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.19.1.5-2.

9.1.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.19.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.19.1.5 Test requirement

Table 9.1.19.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.19.1.5-2.

Table 9.1.19.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters.					

Table 9.1.19.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 10MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 2)	RSRP_30	RSRP_31	RSRP_32
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 1)	RSRP_35	RSRP_36	RSRP_37
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test system uncertainties applicable to this test are undefined

-The Test tolerances applicable to this test are undefined

-The cell configuration mapping for this test case is undefined in Annex E

-Test case applicability is still being discussed.

9.1.19.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.19.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.19.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.3

9.1.19.1_1.4 Test description

9.1.19.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.19.1.4.1 with the following exceptions:

- Instead of 9.1.19.1.4.3 → use 9.1.19.1_1.4.3.

9.1.19.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.19.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.19.1_1.5-2.

9.1.19.1_1.4.3 Message contents

Same message contents as in clause 9.1.19.1.4.3

9.1.19.1_1.5 Test requirement

Table 9.1.19.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.19.1_1.5-2.

Table 9.1.19.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76+TT	N/A	
	Bands TDD_C		-86.76+TT		
	Bands TDD_E		-85.76+TT		
	Bands TDD_A	dBm/4.5MHz	N/A	-85.44+TT	
	Bands TDD_C			-84.44+TT	
	Bands TDD_E			-83.44+TT	
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1_1.5-1 for the other parameters.					

Table 9.1.19.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 10MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Lowest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz

9.1.19.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.19.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 supporting CA.

9.1.19.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.19.2.4 Test description

9.1.19.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.19.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.19.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.19.2.5-1.

- Instead of Table 9.1.7.2.5-2 → use Table 9.1.19.2.5-2.

9.1.19.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.19.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.19.2.5 Test requirement

Table 9.1.19.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.19.2.5-2.

Table 9.1.19.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters.					

Table 9.1.19.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

9.1.19.2_1.1 Test purpose

Same test purpose as in clause 9.1.19.2.1.

9.1.19.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.19.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.19.2_1.4 Test description

9.1.19.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.19.2.4.1.

9.1.19.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.19.2.4.2 with the following exceptions:

- Instead of Table 9.1.19.2.5-1 → use Table 9.1.19.2_1.5-1.
- Instead of Table 9.1.19.2.5-2 → use Table 9.1.19.2_1.5-2.

9.1.19.2_1.4.3 Message contents

Same message contents as in clause 9.1.19.2.4.3

9.1.19.2_1.5 Test requirement

Table 9.1.19.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.19.2_1.5-2.

Table 9.1.19.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters.					

Table 9.1.19.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2 1
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.20.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.20.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1.3.

9.1.20.1.4 Test description

9.1.20.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.20.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.20.1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.20.1.5-1.

- Instead of Table 9.1.6.1.5-3 → use Table 9.1.20.1.5-2.

9.1.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.20.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.20.1.5 Test requirement

Table 9.1.20.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.20.1.5-2.

Table 9.1.20.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_C Note 5		-89.76		
	Bands FDD_D Note 5		-89.26		
	Bands FDD_E, FDD_F Note 5		-88.76		
	Bands FDD_G Note 5		-87.76		
	Bands FDD_H Note 5		-87.26		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The test tolerances applicable to this test are undefined

9.1.20.1_1.1 Test purpose

Same test purpose as in clause 9.1.20.1.1.

9.1.20.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.20.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1_1.3.

9.1.20.1_1.4 Test description

9.1.20.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.20.1.4.1 with the following exceptions:

- Instead of 9.1.20.1.4.3 → use 9.1.20.1_1.4.3.

9.1.20.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.20.1.4.2 with the following exceptions:

- Instead of Table 9.1.20.1.5-1 → use Table 9.1.20.1_1.5-1.
- Instead of Table 9.1.20.1.5-2 → use Table 9.1.20.1_1.5-2.

9.1.20.1_1.4.3 Message contents

Same message contents as in clause 9.1.20.1.4.3.

9.1.20.1_1.5 Test requirement

Table 9.1.20.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.20.1_1.5-2.

Table 9.1.20.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io^{Note2}	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_C Note 5		-89.76		
	Bands FDD_D Note 5		-89.26		
	Bands FDD_E, FDD_F Note 5		-88.76		
	Bands FDD_G Note 5		-87.76		
	Bands FDD_H Note 5		-87.26		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.2.1 Test purpose

Same test purpose as in clause 9.1.6.2.1.

9.1.20.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.20.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2.3.

9.1.20.2.4 Test description

9.1.20.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.20.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.20.2.4.2 Test procedure

Same test procedure as in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.20.2.5-1.

- Instead of Table 9.1.6.2.5-3 → use Table 9.1.20.2.5-2.

9.1.20.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.20.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.20.2.5 Test requirement

Table 9.1.20.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.20.2.5-2.

Table 9.1.20.2.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_C Note 5		-89.76		
	Bands FDD_D Note 5		-89.26		
	Bands FDD_E, FDD_F Note 5		-88.76		
	Bands FDD_G Note 5		-87.76		
	Bands FDD_H Note 5		-87.26		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.2.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

- *Test requirements in normal conditions need to be defined*

9.1.20.2_1.1 Test purpose

Same test purpose as in clause 9.1.20.2.1.

9.1.20.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.20.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2_1.3.

9.1.20.2_1.4 Test description

9.1.20.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.20.2.4.1.

9.1.20.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.20.2.4.2 with the following exceptions:

- Instead of Table 9.1.20.2.5-1 → use Table 9.1.20.2_1.5-1.
- Instead of Table 9.1.20.2.5-2 → use Table 9.1.20.2_1.5-2.

9.1.20.2_1.4.3 Message contents

Same message contents as in clause 9.1.20.2.4.2.

9.1.20.2_1.5 Test requirement

Table 9.1.20.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.20.2_1.5-2.

Table 9.1.20.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76+TT	(Io for Channel 1 +5.51dB)	
	Bands FDD_C Note 5		-89.76+TT		
	Bands FDD_D Note 5		-89.26+TT		

	Bands FDD_E, FDD_F Note 5		-88.76+TT	
	Bands FDD_G Note 5		-87.76+TT	
	Bands FDD_H Note 5		-87.26+TT	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz

9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz

9.1.21.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.21.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.21.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.2.

9.1.21.1.4 Test description

9.1.21.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.21.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.21.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.21.1.5-1.

- Instead of Table 9.1.7.1.5-2 → use Table 9.1.21.1.5-2.

9.1.21.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.21.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.21.1.5 Test requirement

Table 9.1.21.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.21.1.5-2.

Table 9.1.21.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-89.76		
	Bands TDD_E Note 5		-88.76		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.21.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40

Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test tolerances applicable to this test are undefined

9.1.21.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.21.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and release 11 supporting CA.

9.1.21.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.2

9.1.21.1_1.4 Test description

9.1.21.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.21.1.4.1 with the following exceptions:

- Instead of 9.1.21.1.4.3 → use 9.1.21.1_1.4.3.

9.1.21.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.21.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.21.1_1.5-2.

9.1.21.1_1.4.3 Message contents

Same message contents as in clause 9.1.19.1.4.3

9.1.21.1_1.5 Test requirement

Table 9.1.21.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.21.1_1.5-2.

Table 9.1.21.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76+TT	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-89.76+TT		
	Bands TDD_E Note 5		-88.76+TT		
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.1. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.21.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Lowest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Lowest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz

9.1.21.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.21.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.21.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.21.2.4 Test description

9.1.21.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.21.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.21.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.21.2.5-1.

- Instead of Table 9.1.7.2.5-2 → use Table 9.1.21.2.5-2.

9.1.21.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.21.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.21.2.5 Test requirement

Table 9.1.21.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.21.2.5-2.

Table 9.1.21.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C Note 5		-89.76		
	Bands TDD_E Note 5		-88.76		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.21.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Test requirements in normal conditions need to be defined*

9.1.21.2_1.1 Test purpose

Same test purpose as in clause 9.1.21.2.1.

9.1.21.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.21.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.21.2_1.4 Test description

9.1.21.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.21.2.4.1.

9.1.21.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.21.2.4.2 with the following exceptions:

- Instead of Table 9.1.21.2.5-1 → use Table 9.1.21.2_1.5-1.
- Instead of Table 9.1.21.2.5-2 → use Table 9.1.21.2_1.5-2.

9.1.21.2_1.4.3 Message contents

Same message contents as in clause 9.1.21.2.4.3.

9.1.21.2_1.5 Test requirement

Table 9.1.21.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.21.2_1.5-2.

Table 9.1.21.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76+TT	(Io for Channel 1 +5.51dB)	
	Bands TDD_C Note 5		-89.76+TT		
	Bands TDD_E Note 5		-88.76+TT		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.21.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD

9.1.22.1 Test purpose

To verify that FDD and TDD absolute and relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD and TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier, and the relative RSRP accuracy requirements of the secondary component carriers.This test will also verify the relative RSRP accuracy requirements of primary and secondary component carriers.

9.1.22.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.1.22.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.11.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.22.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.22.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.22.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.22.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The FDD-TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.22.3-3 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.22.3-3: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.22.3-4 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.22.3-4: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.22.

9.1.22.4 Test description

9.1.22.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.22.4.3.

4. Cell 1 is PCell on the FDD primary component carrier, Cell 2 is SCell on the TDD secondary component carrier and Cell 3 is the neighbouring cell on the TDD secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.22.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.22.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10 s wait from step 6, SS shall check the reported RSRP values in periodical measurement report messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.22.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.22.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.22.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 1-2”, “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all the events (“Cell 1”, “Cell 2”, “Cell 1-2”, “Cell 2-3”) pass ,the test passes. If one event fails, the test fails.

9.1.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.22.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.22.5 Test requirement

Table 9.1.22.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.22.5-2.

Table 9.1.22.5-1: RSRP TDD-FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note9]			-	6	6
Uplink-downlink configuration[Note9]			-	1	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1 and A.1.2			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.2.1 (OP.1 TDD), and D.2.2 (OP.2 TDD)			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA [Note 2]					
OCNG_RB [Note 2]					
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-117	-	
	Bands FDD_B1, FDD_B2		-116.5	-	
	Bands FDD_C		-116	-	
	Bands FDD_D		-115.5	-	
	Bands FDD_E, FDD_F [Note 6]		-115	-	

	Bands FDD_G		-114	-	
	Bands FDD_H		-113.5	-	
	Bands TDD_A		-	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-		
	Bands TDD_E		-		
$\hat{E}_s / N_{oc}$		dB	-4	3	-1
$\hat{E}_s / I_{ot}$		dB	-4	0.46	-5.76
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-121	-	-
	Bands FDD_B1, FDD_B2		-120.5	-	-
	Bands FDD_C		-120	-	-
	Bands FDD_D		-119.5	-	-
	Bands FDD_E, FDD_F [Note 6]		-119	-	-
	Bands FDD_G		-118	-	-
	Bands FDD_H		-117.5	-	-
	Bands TDD_A		-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-		
	Bands TDD_E		-		
Io[Note3]	Bands FDD_A	dBm/ $BW_{channel}$	-87.76 + 10log($N_{RB, c}$/50)	-	
	Bands FDD_B1, FDD_B2		-87.26 + 10log($N_{RB, c}$/50)	-	
	Bands FDD_C		-86.76+ 10log($N_{RB, c}$/50)	-	
	Bands FDD_D		-86.26+ 10log($N_{RB, c}$/50)	-	
	Bands FDD_E, FDD_F [Note 6]		-85.76+ 10log($N_{RB, c}$/50)	-	
	Bands FDD_G		-84.76+ 10log($N_{RB, c}$/50)	-	
	Bands FDD_H		-84.26+ 10log($N_{RB, c}$/50)	-	
	Bands TDD_A		-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-		
	Bands TDD_E		-		
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3
Time alignment error relative to cell 1 [Note 8]		-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.

Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.22.5-2: 2DL PCELL in FDD RSRP for EUTRA Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.								

Table 9.1.22.5-3: 2DL PCELL in FDD RSRP for EUTRA FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD

9.1.23.1 Test purpose

To verify that FDD and TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD and FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier, and the relative RSRP accuracy requirements of the secondary component carriers. This test will also verify the relative RSRP accuracy requirements of primary and secondary component carriers.

9.1.23.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.1.23.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.11.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.23.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.23.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.23.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.23.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.23.3-3 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.23.3-3: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.23.3-4 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.23.3-4: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, 9.1.11.3 and A.9.1.23.

9.1.23.4 Test description

9.1.23.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.23.4.3.

4. Cell 1 is PCell on the TDD primary component carrier, Cell 2 is SCell on the FDD secondary component carrier and Cell 3 is the neighbouring cell on the FDD secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.23.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.23.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10 s wait from step 6, SS shall check the reported RSRP values in periodical measurement report messages.

   The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.23.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.23.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.23.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events (“Cell 1”, “Cell 2”, “Cell 1-2” and “Cell 2-3”) pass, the test passes. If one event fails, the test fails.

9.1.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.23.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.23.5 Test requirement

Table 9.1.23.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.23.5-2.

Table 9.1.23.5-1: RSRP TDD-FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			6	-	-
Uplink-downlink configuration[Note1]			1	-	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1 and A.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.2.1 (OP.1 TDD), and D.2.2 (OP.2 FDD)			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA [Note 2]					
OCNG_RB [Note 2]					
N_{oc} [Note 3]	Bands FDD_A	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F [Note 9]		-		

	Bands FDD_G		-		
	Bands FDD_H		-		
	Bands TDD_A		-117	-	
	Bands TDD_C		-116	-	
	Bands TDD_E		-115	-	
$\hat{E}_s / N_{oc}$		dB	-4	3	-1
$\hat{E}_s / I_{ot}$		dB	-4	0.46	-5.76
RSRP Note 4	Bands FDD_A	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B1, FDD_B2		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_G		-		
	Bands FDD_H		-		
	Bands TDD_A		-121	-	-
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io Note 4	Bands FDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.33dB+10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_B1, FDD_B2		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_G		-		
	Bands FDD_H		-		
	Bands TDD_A		-87.76 + 10log($N_{RB,c}$/50)	-	
	Bands TDD_C		-86.76 + 10log($N_{RB,c}$/50)	-	
	Bands TDD_E		-85.76 + 10log($N_{RB,c}$/50)	-	
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 8		-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.23.5-2: 2DL PCELL in TDD RSRP for EUTRAN FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.				

Table 9.1.23.5-3: 2DL PCELL in TDD RSRP for EUTRAN FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz

9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz

9.1.24.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.24.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.24.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.3

9.1.24.1.4 Test description

9.1.24.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.1.24.1.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.24.1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.24.1.5-2.

9.1.24.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.1.5 Test requirement

Table 9.1.24.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.24.1.5-2.

Table 9.1.24.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	dBm/$BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/ $BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: For each parameter, the allowed combinations are shown in separate rows.

Table 9.1.24.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 20MHz + 10MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)

9.1.24.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.24.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.24.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.3

9.1.24.1_1.4 Test description

9.1.24.1_1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz for Cell 1 on the PCC, 10MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.1_1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.24.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.24.1_1.5-2.

9.1.24.1_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.1_1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.1_1.5 Test requirement

Table 9.1.24.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.24.1_1.5-2.

Table 9.1.24.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	10	
Measurement bandwidth		n_{PRB}	47-52	22-27	
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.0 TDD	N/A
PDSCH allocation		n_{PRB}	38-61	13-36	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD	R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD), D.2.2 (OP.2 TDD) and D.2.7 (OP.7 TDD)			OP.7 TDD	OP.1 TDD	OP.2 TDD
Io Note2	Bands TDD_A	dBm/18 MHz	-84.76	N/A	
	Bands TDD_C		-83.76		
	Bands TDD_E		-82.76		
	Bands TDD_A	dBm/9MHz	N/A	(Io for Channel 1 +2.33dB)	
	Bands TDD_C				
	Bands TDD_E				
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1_1.5-1 for the other parameters.					

Table 9.1.24.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 20MHz + 10MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)	RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)	RSRP_34	RSRP_35	RSRP_36
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz

9.1.24.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.24.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.24.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.24.2.4 Test description

9.1.24.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.1.24.2.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.24.2.5-1.

- Instead of Table 9.1.7.2.5-2 → use Table 9.1.24.2.5-2.

9.1.24.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.2.5 Test requirement

Table 9.1.24.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.24.2.5-2.

Table 9.1.24.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	dBm/$BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/ $BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.2.5-1 for the other parameters.
Note 4: For each parameter, the allowed combinations are shown in separate rows.

Table 9.1.24.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 20MHz + 10MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)

9.1.24.2_1.1 Test purpose

Same test purpose as in clause 9.1.24.2.1.

9.1.24.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.24.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.24.2_1.4 Test description

9.1.24.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.24.2.4.1.

9.1.24.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.24.2.4.2 with the following exceptions:

- Instead of Table 9.1.24.2.5-1 → use Table 9.1.24.2_1.5-1.
- Instead of Table 9.1.24.2.5-2 → use Table 9.1.24.2_1.5-2.

9.1.24.2_1.4.3 Message contents

Same message contents as in clause 9.1.24.2.4.2

9.1.24.2_1.5 Test requirement

Table 9.1.24.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.24.2_1.5-2.

Table 9.1.24.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io^{Note2}	Bands TDD_A	dBm/$BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/ $BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.2.5-1 for the other parameters.
Note 4: For each parameter, the allowed combinations are shown in separate rows.

Table 9.1.24.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 20MHz + 10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.25.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.1.25.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.25.3 Minimum conformance requirements

Intra-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.2.1.Intra-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.2.2.

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.25.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.25.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.25.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.25.3-2: RSRP Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.25.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.25.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.25.

9.1.25.4 Test description

9.1.25.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.25.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.25.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.25.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.25.5-2. This counts as a Pass or Fail for the events “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.25.5-3. This counts as a Pass or Fail for the events “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.25.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.25.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.25.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.25.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.25.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.25.5 Test requirement

Table 9.1.25.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.25.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.25.5-3.

Table 9.1.25.5-1: RSRP FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Measurement bandwidth		n_{PRB}	22—27	
DTMC period		ms	N/A	160
DTMC period offset			N/A	10
Discovery signal occasion duration		ms	N/A	1
Time offset between cells		µs	2.3	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107	-107
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101.0	-105.0
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05	-71.05
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	6.0	2.0
Propagation condition		-	AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

Table 9.1.25.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_29
Highest reported value (Cell 2)		RSRP_42
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_25
Highest reported value (Cell 2)		RSRP_46

Table 9.1.25.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.26.1 Test purpose

Same test purpose as in clause 9.1.25.1.

9.1.26.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.26.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.25.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.26.

9.1.26.4 Test description

9.1.26.4.1 Initial conditions

Same initial conditions as in clause 9.1.25.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.26.4.3.

9.1.26.4.2 Test procedure

Same test procedure as in clause 9.1.25.4.2 with the following exceptions:

- Instead of Table 9.1.25.5-1 → use Table 9.1.26.5-1.
- Instead of Table 9.1.25.5-2 → use Table 9.1.26.5-2.
- Instead of Table 9.1.25.5-3 → use Table 9.1.26.5-3.

9.1.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.26.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.26.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.26.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.26.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.26.5 Test requirement

Table 9.1.26.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.26.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.26.5-3.

Table 9.1.26.5-1: RSRP TDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Special subframe configuration[Note1]			6	
Uplink/downlink configuration[Note1]			1	
Measurement bandwidth		n_{PRB}	22—27	
DTMC period		ms	N/A	160
DTMC period offset			N/A	10
Discovery signal occasion duration		ms	N/A	2
Time offset between cells		µs	2.3	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note2]				
OCNG_RB[Note2]				
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107	-107
	Bands TDD_C			
	Bands TDD_E			
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0
	Bands TDD_C			
	Bands TDD_E			
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05	-71.05
	Bands TDD_C			
	Bands TDD_E			
$\hat{E}_s / N_{oc}$		dB	6.0	2.0
Propagation condition		-	AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.26.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_29
Highest reported value (Cell 2)		RSRP_42
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_25
Highest reported value (Cell 2)		RSRP_46

Table 9.1.26.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.27.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.1.27.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.1.27.3 Minimum conformance requirements

Inter-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.3.1. Inter-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.3.2.

The requirements for absolute accuracy of RSRP apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.27.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.3 for a corresponding Band

Table 9.1.27.3-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.27.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.27.3-2: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.27.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.27.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.27.

9.1.27.4 Test description

9.1.27.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.27.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.27.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.27.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.27.5-2. This counts as a Pass or Fail for the events “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.27.5-3. This counts as a Pass or Fail for the events “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.27.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.27.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.27.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.27.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.27.5 Test requirement

Table 9.1.27.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.27.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.27.5-3.

Table 9.1.27.5-1: CRS RSRP FDD-FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	1
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands FDD_B1, FDD_B2			-114.5
	Bands FDD_C			-114
	Bands FDD_D			-113.5
	Bands FDD_E, FDD_F Note 5			-113
	Bands FDD_G Note 7			-112
	Bands FDD_H			-111.5
$\hat{E}_s / I_{ot}$		dB	13	-5.2
RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands FDD_B1, FDD_B2			-119.7
	Bands FDD_C			-119.2
	Bands FDD_D			-118.7
	Bands FDD_E, FDD_F Note 5			-118.2
	Bands FDD_G Note 7			-117.2
	Bands FDD_H			-116.7
Io Note3	Bands FDD_A	dBm/9 MHz	(Io for Channel 2 +18.07dB)	-86.07
	Bands FDD_B1, FDD_B2			-85.57
	Bands FDD_C			-85.07
	Bands FDD_D			-84.57
	Bands FDD_E, FDD_F Note 5			-84.04

	Bands FDD_G Note 7			-83.07
	Bands FDD_H			-82.57
$\hat{E}_s / N_{oc}$		dB	13	-5.2
Propagation condition		-	AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 7: Except Band 29 and Band 32.

Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test

Table 9.1.27.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_14
		Bands FDD_B1, FDD_B2	RSRP_15
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_16
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_18
Highest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_26
		Bands FDD_B1, FDD_B2	RSRP_27
		Bands FDD_C	RSRP_27
		Bands FDD_D	RSRP_28
		Bands FDD_E, FDD_F	RSRP_28
		Bands FDD_G	RSRP_29
		Bands FDD_H	RSRP_30
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_10
		Bands FDD_B1, FDD_B2	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_31
		Bands FDD_B1, FDD_B2	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

Table 9.1.27.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 31
Highest reported value (Cell 2)		RSRP_Cell 1 - 18
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 33
Highest reported value (Cell 2)		RSRP_Cell 1 - 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.28.1 Test purpose

Same test purpose as in clause 9.1.27.1.

9.1.28.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.1.28.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.27.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.28.

9.1.28.4 Test description

9.1.28.4.1 Initial conditions

Same initial conditions as in clause 9.1.27.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.28.4.3.

9.1.28.4.2 Test procedure

Same test procedure as in clause 9.1.25.4.2 with the following exceptions:

- Instead of Table 9.1.27.5-1 → use Table 9.1.28.5-1.
- Instead of Table 9.1.27.5-2 → use Table 9.1.28.5-2.
- Instead of Table 9.1.27.5-3 → use Table 9.1.28.5-3.

9.1.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.28.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.28.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.28.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.28.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.28.5 Test requirement

Table 9.1.28.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.28.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.28.5-3.

Table 9.1.28.5-1: CRS RSRP TDD—TDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	2
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note2]				
OCNG_RB[Note2]				
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands TDD_C			-114
	Bands TDD_E			-113
$\hat{E}_s / I_{ot}$		dB	13	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands TDD_C			-119.2
	Bands TDD_E			-118.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	(Io for Channel 2 +18.07B)	-86.07
	Bands TDD_C			-85.07
	Bands TDD_E			-84.07
$\hat{E}_s / N_{oc}$		dB	13	-5.2
Propagation condition		-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the measDS-Config (in TS 36.331 [5]) before the beginning of test

Table 9.1.28.5-2: RSRP TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_26
		Bands TDD_C	RSRP_27
		Bands TDD_E	RSRP_28
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

Table 9.1.28.5-3: RSRP TDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 31
Highest reported value (Cell 2)		RSRP_Cell 1 - 18
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 33
Highest reported value (Cell 2)		RSRP_Cell 1 - 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.29.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.29.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.29.3 Minimum conformance requirements

Intra-frequency absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.14.3.1.1. Intra-frequency relative CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.14.3.1.2.

The absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.29.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.14.2 for a corresponding Band.

Table 9.1.29.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥ 0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥ 0 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.29.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.15.2 for a corresponding Band.

Table 9.1.29.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	CSI Ês/Iot [Note 2]	E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/$BW_{Channel}$
±2	±3	≥ 0 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: Void
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.29.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.29.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.29.

9.1.29.4 Test description

9.1.29.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 as appropriate for UE with 2Rx RF band and Annex A, Figure A.78a (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.29.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.29.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.29.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.29.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 2 is compared to the reported CSI-RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.29.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.29.4.3-1: Common Exception message for CSI-RSRP FDD intra frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-1 Table H.3.8-4 Table H.3.8-5

Table 9.1.29.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP FDD intra frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.29.4.3-3: *MeasResults*: Additional CSI-RSRP FDD intra frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 2	
csi-RSRP-Result-r12	INTEGER(0.97)	Set according to specific test	
}			
}			
}			

9.1.29.5 Test requirement

Table 9.1.29.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.29.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.29.5-3.

Table 9.1.29.5-1: CSI-RSRP FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
DMTC period		ms	160	
DMTC period offset		ms	10	
Discovery signal occasion duration		ms	1	
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	2.3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
p-C-r10[2]		dB	6	6
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-116	
	Bands FDD_B1, FDD_B2		-115.5	
	Bands FDD_C		-115	
	Bands FDD_D		-114.5	
	Bands FDD_E, FDD_F [Note 5]		-114	
	Bands FDD_G [Note 7]		-113	
	Bands FDD_H		-112.5	
CRS $\hat{E}_s/I_{ot}$		dB	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	6.46	1.04
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-113	-117
	Bands FDD_B1, FDD_B2		-112.5	-116.5
	Bands FDD_C		-112	-116
	Bands FDD_D		-111.5	-115.5
	Bands FDD_E, FDD_F [Note 5]		-111	-115
	Bands FDD_G [Note 7]		-110	-114
	Bands FDD_H		-109.5	-113.5
CSI-RSRP [Note3]	Bands FDD_A	dBm/15 kHz	(RSRP	(RSRP

	Bands FDD_B1, FDD_B2		for Cell 1 +6dB)	for Cell 2 +6.8dB)
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	-82.43	
	Bands FDD_B1, FDD_B2		-81.93	
	Bands FDD_C		-81.43	
	Bands FDD_D		-80.93	
	Bands FDD_E, FDD_F Note 5		-80.43	
	Bands FDD_G Note 7		-79.43	
	Bands FDD_H		-78.93	
CRS $\hat{E}_s / N_{oc}$		dB	3	-1
CSI-RS $\hat{E}_s / N_{oc}$		dB	9	5.8
Propagation condition		-	AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 7: Except Band 29 and Band 32.

Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test

Table 9.1.29.5-2: CSI-RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Event	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26	CSI_RSRP_27	CSI_RSRP_28
Highest reported value (Cell 2)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40
Extreme Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23	CSI_RSRP_23
Highest reported value (Cell 2)		CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_44	CSI_RSRP_45

Table 9.1.29.5-3: CSI-RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 7
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.30.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.30.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.30.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.29.3

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.30.

9.1.30.4 Test description

9.1.30.4.1 Initial conditions

Same initial conditions as in clause 9.1.29.4.1 with the following exception:

- Message contents are defined in clause 9.1.30.4.3.

9.1.30.4.2 Test procedure

Same test procedure as in clause 9.1.29.4.2 with the following exceptions:

- Instead of Table 9.1.29.5-1 → use Table 9.1.30.5-1.
- Instead of Table 9.1.29.5-2 → use Table 9.1.30.5-2.
- Instead of Table 9.1.29.5-3 → use Table 9.1.30.5-3.

9.1.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.30.4.3-1: Common Exception message for CSI-RSRP TDD intra frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-1 Table H.3.8-4 Table H.3.8-5

Table 9.1.30.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP TDD intra frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.30.4.3-3: *MeasResults*: Additional CSI-RSRP TDD intra frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 2	
csi-RSRP-Result-r12	INTEGER(0.97)	Set according to specific test	
}			
}			
}			

9.1.30.5 Test requirement

Table 9.1.30.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.30.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.30.5-3.

Table 9.1.30.5-1: CSI-RSRP TDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
DMTC period		ms	160	
DMTC period offset		ms	10	
Discovery signal occasion duration		ms	2	
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	2.3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
p-C-r10[2]		dB	6	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-116	
	Bands TDD_C		-115	
	Bands TDD_E		-114	
CRS $\hat{E}_s/I_{ot}$		dB	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	6.46	1.04
RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-113	-117
	Bands TDD_C		-112	-116
	Bands TDD_E		-111	-115
CSI-RSRP [Note3]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 1 +6dB)	(RSRP for Cell 2 +6.8dB)
	Bands TDD_C			
	Bands TDD_E			
Io[Note3]	Bands TDD_A	dBm/9 MHz	-82.43	
	Bands TDD_C		-81.43	
	Bands TDD_E		-80.43	
CRS $\hat{E}_s/N_{oc}$		dB	3	-1
CSI-RS $\hat{E}_s/N_{oc}$		dB	9	5.8
Propagation condition		-	AWGN	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a				

	constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Table 9.1.30.5-2: CSI-RSRP TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_38
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22
Highest reported value (Cell 2)		CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43

Table 9.1.30.5-3: CSI-RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 7
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.31.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.31.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bits 16 and 25.

9.1.31.3 Minimum conformance requirements

Inter-frequency absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.14.3.2.1. Inter-frequency relative CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.14.3.2.2.

The absolute CSI-RSRP measurement accuracy requirements for discovery signal measurements apply to a cell or TP on a different carrier frequency from that of the serving cell.

The accuracy requirements in Table 9.1.31.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.16.2 for a corresponding band.

Table 9.1.31.3-1: Inter-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥0 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on a different frequency from another cell or from another TP.

The accuracy requirements in Table 9.1.31.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.17.2 for a corresponding band.

$$\left|CSI\_RSRP1\big|_{dBm} - CSI\_RSRP2\big|_{dBm}\right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.31.3-2: Inter-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥0 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.31.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.31.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.31.

9.1.31.4 Test description

9.1.31.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 as appropriate for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.31.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.31.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.31.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.31.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 2 is compared to the reported CSI-RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.31.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.31.4.3-1: Common Exception message for CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-2 Table H.3.8-4 Table H.3.8-5 Table H.3.8-6

Table 9.1.31.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		Cell 1
	10		Cell 2
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	Cell 1
	PhysCellId of Cell 2	INTEGER(0..503)	Cell 2
scramblingIdentity-r12	0		
resourceConfig-r12	2		Cell 1
	4		Cell 2
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.31.4.3-3: *MeasResults*: Additional CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		Cell 1
	2		Cell 2
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.31.5 Test requirement

Table 9.1.31.5-1 defines the primary level settings including test tolerances for all tests.

The CS-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.31.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.31.5-3.

Table 9.1.31.5-1: CSI-RSRP FDD-FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	160	160
DMTC period offset		ms	0	10
Discovery signal occasion duration		ms	1	1
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
p-C-r10[2]		dB	0	6
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands FDD_B1, FDD_B2			-114.5
	Bands FDD_C			-114
	Bands FDD_D			-113.5
	Bands FDD_E, FDD_F Note 5			-113
	Bands FDD_G Note 7			-112
	Bands FDD_H			-111.5
CRS $\hat{E}_s/I_{ot}$		dB	13	-6
CSI-RS $\hat{E}_s/I_{ot}$		dB	13	0.8
RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 2 +25dB)	-121
	Bands FDD_B1, FDD_B2			-120.5
	Bands FDD_C			-120
	Bands FDD_D			-119.5
	Bands FDD_E, FDD_F Note 5			-119
	Bands FDD_G Note 7			-118
	Bands FDD_H			-117.5

CSI-RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 1 +0dB)	(RSRP for Cell 2 +6.8dB)
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	(Io for Channel 2 +19.68dB)	-86.25
	Bands FDD_B1, FDD_B2			-85.75
	Bands FDD_C			-85.25
	Bands FDD_D			-84.75
	Bands FDD_E, FDD_F Note 5			-84.25
	Bands FDD_G Note 7			-83.25
	Bands FDD_H			-82.75
CRS $\hat{E}_s / N_{oc}$		dB	13	-6
CSI-RS $\hat{E}_s / N_{oc}$		dB	13	0.8
Propagation condition		-	AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.
Note 7: Except Band 29 and Band 32.
Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Table 9.1.31.5-2: CSI-RSRP FDD-FDD Inter frequency absolute accuracy requirements for the reported values

	Event	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_29	CSI_RSRP_30	CSI_RSRP_31	CSI_RSRP_32	CSI_RSRP_33
Extreme Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_16	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_17	CSI_RSRP_18	CSI_RSRP_19	CSI_RSRP_19
Highest reported value (Cell 2)		CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40	CSI_RSRP_40

Table 9.1.31.5-3: CSI-RSRP FDD-FDD Inter frequency relative accuracy requirements for the reported values

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 25
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 27
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 11

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.32 TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.32.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.32.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bits 16 and 25.

9.1.32.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.31.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.32.

9.1.32.4 Test description

9.1.32.4.1 Initial conditions

Same initial conditions as in clause 9.1.31.4.1 with the following exception:

- Message contents are defined in clause 9.1.32.4.3.

9.1.32.4.2 Test procedure

Same test procedure as in clause 9.1.31.4.2 with the following exceptions:

- Instead of Table 9.1.31.5-1 → use Table 9.1.32.5-1.
- Instead of Table 9.1.31.5-2 → use Table 9.1.32.5-2.
- Instead of Table 9.1.31.5-3 → use Table 9.1.32.5-3.

9.1.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.32.4.3-1: Common Exception message for CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-2 Table H.3.8-4 Table H.3.8-5 Table H.3.8-6

Table 9.1.32.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		Cell 1
	10		Cell 2
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	Cell 1
	PhysCellId of Cell 2	INTEGER(0..503)	Cell 2
scramblingIdentity-r12	0		
resourceConfig-r12	2		Cell 1
	4		Cell 2
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.32.4.3-3: *MeasResults*: Additional CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		Cell 1
	2		Cell 2
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.32.5 Test requirement

Table 9.1.32.5-1 defines the primary level settings including test tolerances for all tests.

The CS-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.32.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.32.5-3.

Table 9.1.32.5-1: CSI-RSRP TDD-TDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	160	160
DMTC period offset		ms	0	10
Discovery signal occasion duration		ms	2	2
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note2]				
OCNG_RB[Note2]				
p-C-r10[2]		dB	0	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands TDD_C			-114
	Bands TDD_E			-113
CRS $\hat{E}_s/I_{ot}$		dB	13	-6
CSI-RS $\hat{E}_s/I_{ot}$		dB	13	0.8
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 2 +25dB)	-121
	Bands TDD_C			-120
	Bands TDD_E			-119
CSI-RSRP [Note3]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 1 +0dB)	(RSRP for Cell 2 +6.8dB)
	Bands TDD_C			
	Bands TDD_E			
Io[Note4]	Bands TDD_A	dBm/9 MHz	(Io for Channel 2 +18.24dB)	-86.25
	Bands TDD_C			-85.25
	Bands TDD_E			-84.25

CRS $\hat{E}_s / N_{oc}$	dB	13	-6
CSI-RS $\hat{E}_s / N_{oc}$	dB	13	0.8
Propagation condition	-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.
Note 7: DMTC is provided to the UE in the measDS-Config (in TS 36.331) before the beginning of test.

Table 9.1.32.5-2: CSI-RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22
Highest reported value (Cell 2)		CSI_RSRP_[32	CSI_RSRP_33	CSI_RSRP_34
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_18
Highest reported value (Cell 2)		CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_39

Table 9.1.32.5-3: CSI-RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 25
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 27
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 11

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.1.33.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in carrier aggregation in CRS based discovery signal are within the specified limits.

9.1.33.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.1.33.3 Minimum conformance requirements

RSRP measurement of cells on the primary component carrier or any of the secondary component carrier(s) in discovery signal occasions shall meet the intra frequency absolute accuracy requirements in TS 36.133 [4] section 9.1.2.1.

The accuracy requirements in Table 9.1.33.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.1.33.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in TS 36.133 [4] sections 9.1.2.2.

The accuracy requirements in Table 9.1.33.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.33.3-2: RSRP Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in TS 36.133 [4] sections 9.1.3.2.

The accuracy requirements in Table 9.1.33.3-3 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.33.3-3: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.33.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.33.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.2, clause 9.1.4 and A.9.1.33.

9.1.33.4 Test description

9.1.33.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.33.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.33.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.33.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 3 reported by the UE is compared to actual RSRP value according to Table 9.1.33.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
   The reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell2 and Cell1 for each MeasurementReport message according to Table 9.1.33.5-3. This counts as a Pass or Fail for the events “Cell 2-3” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 3”, “Cell 2-3” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.33.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.33.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.33.5 Test requirement

Table 9.1.33.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.33.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.33.5-3.

Table 9.1.33.5-1: RSRP FDD carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
DMTC period		ms	N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration		ms	N/A	N/A	1
Timing offset to cell1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_C		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_C		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		

	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.33.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_18
		Bands FDD_B1, FDD_B2	RSRP_19
		Bands FDD_C	RSRP_19
		Bands FDD_D	RSRP_20
		Bands FDD_E, FDD_F	RSRP_20
		Bands FDD_G	RSRP_21
		Bands FDD_H	RSRP_22
Highest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_30
		Bands FDD_B1, FDD_B2	RSRP_31
		Bands FDD_C	RSRP_31
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_32
		Bands FDD_G	RSRP_33
		Bands FDD_H	RSRP_34
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_14
		Bands FDD_B1, FDD_B2	RSRP_14
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_15
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_17
Highest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_35
		Bands FDD_B1, FDD_B2	RSRP_35
		Bands FDD_C	RSRP_36
		Bands FDD_D	RSRP_36
		Bands FDD_E, FDD_F	RSRP_37
		Bands FDD_G	RSRP_38
		Bands FDD_H	RSRP_38

Table 9.1.33.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 2
Highest reported value (Cell 3)		RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 4
Highest reported value (Cell 3)		RSRP_Cell 1 + 13

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.1.34.1 Test purpose

Same test purpose as in clause 9.1.33.1.

9.1.34.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.1.34.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.33.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.2, clause 9.1.4 and A.9.1.34.

9.1.34.4 Test description

9.1.34.4.1 Initial conditions

Same initial conditions as in clause 9.1.33.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.34.4.3.

9.1.34.4.2 Test procedure

Same test procedure as in clause 9.1.33.4.2 with the following exceptions:

- Instead of Table 9.1.33.5-1 → use Table 9.1.34.5-1.
- Instead of Table 9.1.33.5-2 → use Table 9.1.34.5-2.
- Instead of Table 9.1.33.5-3 → use Table 9.1.34.5-3.

9.1.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.34.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.34.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.34.5 Test requirement

Table 9.1.34.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.34.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.34.5-3.

Table 9.1.34.5-1: Carrier aggregation RSRP test parameters for TDD

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell 3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
DMTC period		ms	N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration		ms	N/A	N/A	2
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		

$\hat{E}_s / N_{oc}$	dB	-4	3	-0.2
Propagation condition	-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.34.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_18
		Bands TDD_C	RSRP_19
		Bands TDD_E	RSRP_20
Highest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_30
		Bands TDD_C	RSRP_31
		Bands TDD_E	RSRP_32
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_35
		Bands TDD_C	RSRP_36
		Bands TDD_E	RSRP_37

Table 9.1.34.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	**Test 1 All bands**
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 2
Highest reported value (Cell 3)		RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 4
Highest reported value (Cell 3)		RSRP_Cell 1 + 13

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

9.1.35.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies for carrier aggregation in CSI-RS based discovery signal are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier, the absolute CSI-RSRP accuracy requirements of the secondary component carrier, and the relative CSI-RSRP accuracy requirements of the secondary component carrier. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement.

9.1.35.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CA and CSI-RS based discovery signals measurement.

9.1.35.3 Minimum conformance requirements

The CSI-RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.1. The CSI-RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2.

The absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.35.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.14.2 for a corresponding Band.

Table 9.1.35.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI $\hat{E}s/Iot$	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥ 0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥ 0 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Comparisons between CSI-RSRP of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2. Comparisons between CSI-RSRP of cells on the

same secondary component carrier shall meet the intra-frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.35.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.15.2 for a corresponding Band.

Table 9.1.35.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥ 0 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the CSI-RSRP inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.2.2.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on a different frequency from another cell or from another TP.

The accuracy requirements in Table 9.1.35.3-3 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.17.2 for a corresponding band.

$$\left| CSI\_RSRP1|_{dBm} - CSI\_RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.35.3-3: Inter-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥0 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.35.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.35.3-4: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3, 9.1.15.2, and A.9.1.35.

9.1.35.4 Test description

9.1.35.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.35.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.35.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates the SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13 and 6.1.3.8). Wait for at least 2 seconds (Refer to TS 36.133 [4] clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.35.5-1 as appropriate. Propagation conditions are set according to Annex B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.
   The reported CSI-RSRP values of Cell 1 and Cell 2 reported by the UE are compared to actual CSI-RSRP values according to Table 9.1.35.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 1 or Cell 2, the number of failed iterations is increased by one.
   The reported CSI-RSRP values of Cell 1 and Cell 2 reported by the UE are compared to the reported CSI-RSRP values of other cells for each MeasurementReport message according to Table 9.1.35.5-3. This counts as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value of Cell 1 or Cell 2, the number of failed iterations is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If the test configuration is inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1”, “Cell 2”, “Cell 1-2”, and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.35.4.3-1: Common Exception message for CSI-RSRP FDD Carrier Aggregation accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-3 Table H.3.8-4 Table H.3.8-5

Table 9.1.35.4.3-2: *MeasDS-Config-DEFAULT-PCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.35.4.3-3: *MeasDS-Config-DEFAULT-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 3	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	6		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.35.4.3-4: *MeasResults-PCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 9.1.35.4.3-5: *MeasResults-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 2	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 3	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.35.5 Test requirement

Table 9.1.35.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.35.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.35.5-3.

Table 9.1.35.5-1: CSI-RSRP FDD Carrier Aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
DMTC period		ms	160	160	
DMTC period offset		ms	0	10	
Discovery signal occasion duration		ms	1	1	
CSI-RS resource configuration			2	4	6
CSI-RS periodicity		ms	10	10	10
CSI-RS subframe offset		ms	0	0	0
CSI-RS individual offset[2]		dB	0	0	0
CSI-RS muting			Enable	Enable	Enable
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
p-C-r10[2]		dB	6	6	6
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
CRS $\hat{E}_s / I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s / I_{ot}$		dB	2	6.46	0.24
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		

	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
CSI-RSRP Note3	Bands FDD_A	dBm/15 kHz	-115	(CSI-RSRP for Cell 1 +8dB)	(CSI-RSRP for Cell 1 +4dB)
	Bands FDD_B1, FDD_B2		-114.5		
	Bands FDD_C		-114		
	Bands FDD_D		-113.5		
	Bands FDD_E, FDD_F Note 6		-113		
	Bands FDD_G		-112		
	Bands FDD_H		-111.5		
Io Note3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B1, FDD_B2		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
CRS $\hat{E}_s / N_{oc}$		dB	-4	3	-1
CSI-RS $\hat{E}_s / N_{oc}$		dB	2	9	5
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Table 9.1.35.5-2: CSI-RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Event	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_19	CSI_RSRP_20	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23
Highest reported value (Cell 1)		CSI_RSRP_32	CSI_RSRP_32	CSI_RSRP_33	CSI_RSRP_33	CSI_RSRP_34	CSI_RSRP_35	CSI_RSRP_35
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_28	CSI_RSRP_29	CSI_RSRP_29	CSI_RSRP_30	CSI_RSRP_31
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_43
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_15	CSI_RSRP_15	CSI_RSRP_16	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_18	CSI_RSRP_18
Highest reported value (Cell 1)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_45	CSI_RSRP_46	CSI_RSRP_46	CSI_RSRP_47	CSI_RSRP_48
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.								

Table 9.1.35.5-3: CSI-RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 + 2
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 15
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 9
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 – 1
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

9.1.36.1 Test purpose

The purpose of this test is to verify that the TDD CSI-RSRP absolute and relative measurement accuracies for carrier aggregation in CSI-RS based discovery signal are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier, the absolute CSI-RSRP accuracy requirements of the secondary component carrier, and the relative CSI-RSRP accuracy requirements of the secondary component carrier. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement.

9.1.36.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CA and CSI-RS based discovery signals measurement.

9.1.36.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.35.3

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3, 9.1.15.2, and A.9.1.36.

9.1.36.4 Test description

9.1.36.4.1 Initial conditions

Same initial conditions as in clause 9.1.35.4.1 with the following exception:

- Message contents are defined in clause 9.1.36.4.3.

9.1.36.4.2 Test procedure

Same test procedure as in clause 9.1.35.4.2 with the following exceptions:

- Instead of Table 9.1.35.5-1 → use Table 9.1.36.5-1.
- Instead of Table 9.1.35.5-2 → use Table 9.1.36.5-2.
- Instead of Table 9.1.35.5-3 → use Table 9.1.36.5-3.

9.1.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.36.4.3-1: Common Exception message for CSI-RSRP TDD Carrier Aggregation accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-3 Table H.3.8-4 Table H.3.8-5

Table 9.1.36.4.3-2: *MeasDS-Config-DEFAULT-PCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.36.4.3-3: *MeasDS-Config-DEFAULT-SCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 3	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	6		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.36.4.3-4: *MeasResults-PCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 9.1.36.4.3-5: *MeasResults-SCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 2	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 3	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.36.5 Test requirement

Table 9.1.36.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.36.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.36.5-3.

Table 9.1.36.5-1: CSI-RSRP TDD Carrier Aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
DMTC period		ms	160	160	
DMTC period offset		ms	0	10	
Discovery signal occasion duration		ms	2	2	
CSI-RS resource configuration			2	4	6
CSI-RS periodicity		ms	10	10	10
CSI-RS subframe offset		ms	0	0	0
CSI-RS individual offset[2]		dB	0	0	0
CSI-RS muting			Enable	Enable	Enable
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
p-C-r10[2]		dB	6	6	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
CRS $\hat{E}_s / I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s / I_{ot}$		dB	2	6.46	0.24
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
CSI-RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-115	(CSI-RSRP for Cell 1 +8dB)	(CSI-RSRP for Cell 1 +4dB)
	Bands TDD_C		-114		
	Bands TDD_E		-113		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
CRS $\hat{E}_s / N_{oc}$		dB	-4	3	-1

CSI-RS $\hat{E}_s / N_{oc}$	dB	2	9	5
Propagation condition	-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Table 9.1.36.5-2: CSI-RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_19	CSI_RSRP_20	CSI_RSRP_21
Highest reported value (Cell 1)		CSI_RSRP_32	CSI_RSRP_33	CSI_RSRP_34
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_29
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_42
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_15	CSI_RSRP_16	CSI_RSRP_17
Highest reported value (Cell 1)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_38
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_25
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_46

Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

Table 9.1.36.5-3: CSI-RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 + 2
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 15
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 9
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 – 1
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.37 to 9.1.40_1Void

9.1.41 FD-FDD Intra frequency RSRP Accuracy for UE category 0

9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.41.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.41.1.2 Test applicability

This test applies to E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.41.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.41.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.41.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.41.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.41.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.41.

9.1.41.1.4 Test description

9.1.41.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.41.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.41.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.41.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.41.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.41.1.5-1 as appropriate.

9.1.41.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.41.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.41.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.41.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.41.1.5 Test requirement

Table 9.1.41.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.41.1.5-2.

Table 9.1.41.1.5-1: FD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 4]						-114	
	Bands FDD_G [Note 6]						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F [Note 4]						-111	-114.2
	Bands FDD_G [Note 6]						-110	-113.2
	Bands FDD_H						-109.5	-112.7
Io[Note3]	Bands FDD_A	dBm/9 MHz	*-71.05*		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F [Note 4]						-80.25	
	Bands FDD_G [Note 6]						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.41.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.41.2.1 Test purpose

To verify that the FD-FDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.41.2.2 Test applicability

This test applies to all types of E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.41.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.41.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.41.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.41.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.41.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.41.

9.1.41.2.4 Test description

9.1.41.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.41.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.41.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.41.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.41.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.41.2.5-1 as appropriate.

9.1.41.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.41.2.4.3-1: Common Exception messages for RSRP FD-FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.41.2.4.3-2: *MeasResults*: Additional RSRP FD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.41.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.41.2.5 Test requirement

Table 9.1.41.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FD-FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.41.2.5-2.

Table 9.1.41.2.5-1: FD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-106		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 4]						-114	
	Bands FDD_G [Note 6]						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands FDD_B						-112.5	-115.5
	Bands FDD_C						-112	-115
	Bands FDD_D						-111.5	-114.5
	Bands FDD_E, FDD_F [Note 4]						-111	-114
	Bands FDD_G [Note 6]						-110	-113
	Bands FDD_H						-109.5	-112.5
Io[Note3]	Bands FDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_C						-81.20	
	Bands FDD_D						-80.70	
	Bands FDD_E, FDD_F [Note 4]						-80.20	
	Bands FDD_G [Note 6]						-79.20	
	Bands FDD_H						-78.70	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.41.2.5-2: RSRP FD-FDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_D	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_H	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.42 HD-FDD Intra frequency RSRP Accuracy for UE category 0

9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.42.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.42.1.2 Test applicability

This test applies to all types of E-UTRA HD-FDD operation Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.42.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.42.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.42.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.42.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.42.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.42.

9.1.42.1.4 Test description

9.1.42.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.42.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.42.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.42.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.42.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.42.1.5-1 as appropriate.

9.1.42.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.42.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.42.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.42.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.42.1.5 Test requirement

Table 9.1.42.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.42.1.5-2.

Table 9.1.42.1.5-1: HD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.20
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.20
	Bands FDD_D						-111.5	-114.70
	Bands FDD_E, FDD_F Note 4						-111	-114.20
	Bands FDD_G Note 6						-110	-113.20
	Bands FDD_H						-109.5	-112.70
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 4						-80.25	
	Bands FDD_G Note 6						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are

not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.1.42.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.42.2.1 Test purpose

To verify that the HD-FDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.42.2.2 Test applicability

This test applies to all types of E-UTRA HD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.42.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.42.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.42.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.42.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.42.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.42.

9.1.42.2.4 Test description

9.1.42.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.42.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.42.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.42.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.42.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.42.2.5-1 as appropriate.

9.1.42.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.42.2.4.3-1: Common Exception messages for RSRP HD-FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.42.2.4.3-2: *MeasResults*: Additional RSRP HD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.42.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP HD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.42.2.5 Test requirement

Table 9.1.42.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.42.2.5-2.

Table 9.1.42.2.5-1: HD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands FDD_B						-112.5	-115.5
	Bands FDD_C						-112	-115
	Bands FDD_D						-111.5	-114.5
	Bands FDD_E, FDD_F Note 4						-111	-114
	Bands FDD_G Note 6						-110	-113
	Bands FDD_H						-109.5	-112.5
Io Note3	Bands FDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_C						-81.20	
	Bands FDD_D						-80.70	
	Bands FDD_E, FDD_F Note 4						-80.20	
	Bands FDD_G Note 6						-79.20	
	Bands FDD_H						-78.70	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are

not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.1.42.2.5-2: RSRP HD-FDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_D	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_H	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.43 TDD Intra frequency RSRP Accuracy for UE category 0

9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.43.1.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.43.1.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.43.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.43.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.43.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.43.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.43.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.43.

9.1.43.1.4 Test description

9.1.43.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.43.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.43.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.43.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.43.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.43.1.5-1 as appropriate.

9.1.43.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.43.1.4.3-1: Common Exception messages for RSRP TDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.43.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.43.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.43.1.5 Test requirement

Table 9.1.43.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.43.1.5-2.

Table 9.1.43.1.5-1: TDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration Note1			6		6		6	
Uplink/downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-1076		-87		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note4	Bands TDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.20
	Bands TDD_C						-112	-115.20
	Bands TDD_E						-111	-114.20
Io Note4	Bands TDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.43.1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands TDD_A	RSRP_16
			Bands TDD_C	RSRP_17
			Bands TDD_E	RSRP_18
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands TDD_A	RSRP_33
			Bands TDD_C	RSRP_34
			Bands TDD_E	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands TDD_A	RSRP_13
			Bands TDD_C	RSRP_14
			Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands TDD_A	RSRP_36
			Bands TDD_C	RSRP_37
			Bands TDD_E	RSRP_38
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.43.2.1 Test purpose

To verify that the TDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.43.2.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.43.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.43.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2|dBm according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.43.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.43.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.43.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.43.

9.1.43.2.4 Test description

9.1.43.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.43.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.43.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.43.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.43.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.43.2.5-1 as appropriate.

9.1.43.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.43.2.4.3-1: Common Exception messages for RSRP TDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.43.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.43.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.43.2.5 Test requirement

Table 9.1.43.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.43.2.5-2.

Table 9.1.43.2.5-1: TDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-106		-87		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands TDD_C						-112	-115
	Bands TDD_E						-111	-114
Io[Note4]	Bands TDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands TDD_C						-81.20	
	Bands TDD_E						-80.20	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.43.2.5-2: RSRP TDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands TDD_A	RSRP_x-9
			Bands TDD_C	RSRP_x-9
			Bands TDD_E	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands TDD_A	RSRP_x+3
			Bands TDD_C	RSRP_x+3
			Bands TDD_E	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands TDD_A	RSRP_x-9
			Bands TDD_C	RSRP_x-9
			Bands TDD_E	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands TDD_A	RSRP_x+3
			Bands TDD_C	RSRP_x+3
			Bands TDD_E	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.44 to 9.1.51 Void

9.1.52 FD-FDD RSRP Intra frequency case for BL/CE UE in CEModeA

9.1.52.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for FD-FDD intra frequency RSRP measurements for BL/CE UE in CEModeA.

9.1.52.2 Test applicability

This test applies to all types of E-UTRA FD-FDD BL/CE UE release 13 and forward of UE category M1 and higher that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.52.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.52.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.52.3-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±7	±10	≥-6 dB	FDD-M1_A, TDD-M1_A	-121	N/A	-70
			FDD-M1_B	-119.5	N/A	-70
			FDD-M1_D	-119	N/A	-70
			FDD-M1_E, TDD-M1_E	-118.5	N/A	-70
			FDD-M1_F	-118	N/A	-70
			FDD-M1_G	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD-M1_A, TDD-M1_A, FDD-M1_D, FDD-M1_E, TDD-M1_E, FDD-M1_F, FDD-M1_G, FDD-M1_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.52.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.52.3-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD-M1_A, TDD-M1_A	-121	-50
			FDD-M1_B	-119.5	-50
			FDD-M1_D	-119	-50
			FDD-M1_E, TDD-M1_E	-118.5	-50
			FDD-M1_F	-118	-50
			FDD-M1_G	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.52.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.52.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.52.

9.1.52.4 Test description

9.1.52.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B.0.
3. Message contents are defined in clause 9.1.52.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.52.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Table 9.1.52.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. The SS shall transmit the RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. The UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, the SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.52.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRP value of Cell 2 is compared to the reported RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.52.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.52.5-1 as appropriate.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 9.1.52.4.3-1: Common Exception messages for FD-FDD RSRP Intra frequency case for UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1a with Gap Pattern Id = 0 Table H.3.5-3a Table H.7.1-1

Table 9.1.52.4.3-2: *MeasResults*: Additional FD-FDD RSRP Intra frequency case UE in CEModeA test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.52.4.3-3: *MeasResultListEUTRA*: Additional FD-FDD RSRP Intra frequency case UE in CEModeA test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.52.5 Test requirement

Table 9.1.52.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.52.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.52.5-3.

Table 9.1.52.5-1: FD-FDD RSRP Intra frequency test parameters in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.20 FDD	-	R.20 FDD	-	R.20 FDD	-
PDSCH allocation		n_{PRB}	Follows R.20 FDD	-	Follows R.20 FDD	-	Follows R.20 FDD	-
MPDCCH Reference measurement channel			R.16 FDD		R.16 FDD		R.16 FDD	
OCNG Patterns			OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD-M1_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD-M1_B						-115.5	
	Bands FDD-M1_C						-115	
	Bands FDD-M1_D						-114.5	
	Bands FDD-M1_E, FDD-M1_F Note 4						-114	
	Bands FDD-M1_G Note 6						-113	
	Bands FDD-M1_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD-M1_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD-M1_B						-112.5	-115.7
	Bands FDD-M1_C						-112	-115.2
	Bands FDD-M1_D						-111.5	-114.7
	Bands FDD-M1_E, FDD-M1_F Note 4						-111	-114.2
	Bands FDD-M1_G Note 6						-110	-113.2
	Bands FDD-M1_H						-109.5	-112.7
Io Note3	Bands FDD-M1_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD-M1_B						-81.75	
	Bands FDD-M1_C						-81.25	
	Bands FDD-M1_D						-80.75	
	Bands FDD-M1_E, FDD-M1_F Note 4						-80.25	
	Bands FDD-M1_G Note 6						-79.25	
	Bands FDD-M1_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Note 6: Except Band 29 and Band 32.

Table 9.1.52.5-2: FD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD-M1_A	RSRP_16
			Bands FDD-M1_B	RSRP_16
			Bands FDD-M1_C	RSRP_17
			Bands FDD-M1_D	RSRP_17
			Bands FDD-M1_E, FDD-M1_F	RSRP_18
			Bands FDD-M1_G	RSRP_19
			Bands FDD-M1_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD-M1_A	RSRP_33
			Bands FDD-M1_B	RSRP_33
			Bands FDD-M1_C	RSRP_34
			Bands FDD-M1_D	RSRP_34
			Bands FDD-M1_E, FDD-M1_F	RSRP_35
			Bands FDD-M1_G	RSRP_36
			Bands FDD-M1_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD-M1_A	RSRP_13
			Bands FDD-M1_B	RSRP_13
			Bands FDD-M1_C	RSRP_14
			Bands FDD-M1_D	RSRP_14
			Bands FDD-M1_E, FDD-M1_F	RSRP_15
			Bands FDD-M1_G	RSRP_16
			Bands FDD-M1_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD-M1_A	RSRP_36
			Bands FDD-M1_B	RSRP_36
			Bands FDD-M1_C	RSRP_37
			Bands FDD-M1_D	RSRP_37
			Bands FDD-M1_E, FDD-M1_F	RSRP_38
			Bands FDD-M1_G	RSRP_39
			Bands FDD-M1_H	RSRP_39
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.52.5-3: FD-FDD RSRP Intra frequency relative accuracy requirements for the reported values in CEModeA

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal and Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_Cell 1 - 10	RSRP_Cell 1 -10	RSRP_Cell 1 - 9
Highest reported value (Cell 2)	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.53 HD-FDD RSRP Intra frequency case for BL/CE UE in CEModeA

9.1.53.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for HD-FDD intra frequency RSRP measurements for BL/CE UE in CEModeA.

9.1.53.2 Test applicability

This test applies to all types of E-UTRA HD-FDD BL/CE UE release 13 and forward of UE category M1 and higher that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.53.3 Minimum conformance requirements

Same minimum conformance requirements as in Clause 9.1.52.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.53.

9.1.53.4 Test description

Same test description as in clause 9.1.52.4 with the following exceptions:

- Instead of Table 9.1.52.5-1 → use Table 9.1.53.5-1.
- Instead of Table 9.1.52.5-2 → use Table 9.1.53.5-2.
- Instead of Table 9.1.52.5-3 → use Table 9.1.53.5-3.

9.1.53.5 Test requirement

Table 9.1.53.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.53.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.53.5-3.

Table 9.1.53.5-1: HD-FDD RSRP Intra frequency test parameters in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.10 HD-FDD	-	R.10 HD-FDD	-	R.10 HD-FDD	-
PDSCH allocation		n_{PRB}	Follows R.10 HD-FDD	-	Follows R.10 HD-FDD	-	Follows R.10 HD-FDD	-
MPDCCH Reference measurement channel			R.6 HD-FDD		R.6 HD-FDD		R.6 HD-FDD	
OCNG Patterns			OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD-M1_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD-M1_B						-115.5	
	Bands FDD-M1_C						-115	
	Bands FDD-M1_D						-114.5	
	Bands FDD-M1_E, FDD-M1_F Note 5						-114	
	Bands FDD-M1_G Note 7						-113	
	Bands FDD-M1_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD-M1_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD-M1_B						-112.5	-115.7
	Bands FDD-M1_C						-112	-115.2
	Bands FDD-M1_D						-111.5	-114.7
	Bands FDD-M1_E, FDD-M1_F Note 4						-111	-114.2
	Bands FDD-M1_G Note 6						-110	-113.2
	Bands FDD-M1_H						-109.5	-112.7
Io Note3	Bands FDD-M1_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD-M1_B						-81.75	
	Bands FDD-M1_C						-81.25	
	Bands FDD-M1_D						-80.75	
	Bands FDD-M1_E, FDD-M1_F Note 4						-80.25	
	Bands FDD-M1_G Note 6						-79.25	
	Bands FDD-M1_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.								

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.1.53.5-2: HD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD-M1_A	RSRP_16
			Bands FDD-M1_B	RSRP_16
			Bands FDD-M1_C	RSRP_17
			Bands FDD-M1_D	RSRP_17
			Bands FDD-M1_E, FDD-M1_F	RSRP_18
			Bands FDD-M1_G	RSRP_19
			Bands FDD-M1_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD-M1_A	RSRP_33
			Bands FDD-M1_B	RSRP_33
			Bands FDD-M1_C	RSRP_34
			Bands FDD-M1_D	RSRP_34
			Bands FDD-M1_E, FDD-M1_F	RSRP_35
			Bands FDD-M1_G	RSRP_36
			Bands FDD-M1_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD-M1_A	RSRP_13
			Bands FDD-M1_B	RSRP_13
			Bands FDD-M1_C	RSRP_14
			Bands FDD-M1_D	RSRP_14
			Bands FDD-M1_E, FDD-M1_F	RSRP_15
			Bands FDD-M1_G	RSRP_16
			Bands FDD-M1_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD-M1_A	RSRP_36
			Bands FDD-M1_B	RSRP_36
			Bands FDD-M1_C	RSRP_37
			Bands FDD-M1_D	RSRP_37
			Bands FDD-M1_E, FDD-M1_F	RSRP_38
			Bands FDD-M1_G	RSRP_39
			Bands FDD-M1_H	RSRP_39
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.53.5-3: HD-FDD RSRP Intra frequency relative accuracy requirements for the reported values in CEModeA

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal and Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_Cell 1 - 10	RSRP_Cell 1 -10	RSRP_Cell 1 - 9
Highest reported value (Cell 2)	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2

Table 9.1.53.5-4: *TimeAlignmentTimer* -Configuration for HD-FDD RSRP Intra frequency testing in CEModeA

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	50	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.54 TDD RSRP Intra frequency case for BL/CE UE in CEModeA

9.1.54.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for TDD intra frequency RSRP measurements for BL/CE UE in CEModeA.

9.1.54.2 Test applicability

This test applies to all types of E-UTRA TDD BL/CE UE release 13 and forward of UE category M1 and higher that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.54.3 Minimum conformance requirements

Same minimum conformance requirements as in Clause 9.1.52.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.54.

9.1.54.4 Test description

Same test description as in clause 9.1.52.4 with the following exceptions:

- Instead of Table 9.1.52.5-1 → use Table 9.1.54.5-1.
- Instead of Table 9.1.52.5-2 → use Table 9.1.54.5-2.
- Instead of Table 9.1.52.5-3 → use Table 9.1.54.5-3.

9.1.54.5 Test requirement

Table 9.1.54.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.54.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.54.5-3.

Table 9.1.54.5-1: TDD RSRP Intra frequency test parameters in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.16 TDD	-	R.16 TDD	-	R.16 TDD	-
PDSCH allocation		n_{PRB}	Follows R.16 TDD	-	Follows R.16 TDD	-	Follows R.16 TDD	-
MPDCCH Reference measurement channel			R.14 TDD		R.14 TDD		R.14 TDD	
OCNG Patterns			OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD-M1_A	dBm/15 kHz	-107		-87		-116	
	Bands TDD-M1_C						-115	
	Bands TDD-M1_E						-114	
$\hat{E}_s / N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD-M1_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands TDD-M1_C						-112	-115.2
	Bands TDD-M1_E						-111	-114.2
Io[Note4]	Bands TDD-M1_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands TDD-M1_C						-81.25	
	Bands TDD-M1_E						-80.25	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.54.5-2: TDD RSRP Intra frequency absolute accuracy requirements for the reported values in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands TDD-M1_A	RSRP_16
			Bands TDD-M1_C	RSRP_17
			Bands TDD-M1_E	RSRP_18
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands TDD-M1_A	RSRP_33
			Bands TDD-M1_C	RSRP_34
			Bands TDD-M1_E	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands TDD-M1_A	RSRP_13
			Bands TDD-M1_C	RSRP_14
			Bands TDD-M1_E	RSRP_15
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands TDD-M1_A	RSRP_36
			Bands TDD-M1_C	RSRP_37
			Bands TDD-M1_E	RSRP_38
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.54.5-3: TDD RSRP Intra frequency relative accuracy requirements for the reported values in CEModeA

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – [FFS]
Highest reported value (Cell 2)		RSRP_Cell 1 + [FFS]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell

9.1.55.1 Test purpose

To verify that FDD intra frequency RSRP absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRP accuracy requirement of the secondary component carrier and the relative RSRP accuracy requirement of the secondary component carriers. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement.

9.1.55.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward supporting downlink LAA with FDD as PCell.

9.1.55.3 Minimum conformance requirements

RSRP measurement of cells on secondary component carrier with frame structure 3 shall meet the intra frequency absolute accuracy requirements in TS 36.133 [4] section 9.1.18.2.4.

The requirements for absolute accuracy of RSRP in this clause apply to a cell on a serving carrier frequency.

The accuracy requirements in Table 9.1.55.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.1 of [4] for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-1: RSRP intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FS3_G	-118	N/A	-70
±8	±11	≥-6 dB	FS3_G	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in TS 36.133 [4] sections 9.1.18.2.5.

The accuracy requirements in Table 9.1.55.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.22.1 of [4] for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-2: RSRP intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FS3_G	-118	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in TS 36.133 [4] sections 9.1.18.2.3.

The accuracy requirements in Table 9.1.55.3-3 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.4 of [4] for a corresponding Band

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-3: RSRP inter-frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FS3_G	-118	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.55.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.55.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.19.2, clause 9.1.19.3, 9.1.19.4, clause 9.1.4 and A.9.1.55.

9.1.55.4 Test description

9.1.55.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.55.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.55.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.55.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.55.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 3 is compared to actual RSRP value according to Table 9.1.55.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
   The reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell2 and Cell1 for each MeasurementReport message according to Table 9.1.55.5-3. This counts as a Pass or Fail for the events “Cell 2-3” and “Cell 1-3”. If the UE fails to report the measurement value for Cell2 or Cell 3, the number of failed iterations is increased by one.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 2-3” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration, the test passes. If one event fails, the test fails.

9.1.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.55.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.55.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.55.5 Test requirement

Table 9.1.55.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.55.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.55.5-3.

Table 9.1.55.5-1: Test parameters for FDD RSRP accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	40	40
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	C.3.5
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1 and A.1.6(R.0 FS3)		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	R.0 FS3	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in D.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	OP.13 FDD	OP.14 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				

PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	-	
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
	Bands FS3_G		-	(N_{oc} for Channel 1 +1dB)	
$\hat{E}_s / I_{ot}$		dB	-4	0.09 Note9	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	-	
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
	Bands FS3_G		-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
Io Note3	Bands FDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	-87.76 +10log($N_{RB,c}$/50)	-	
	Bands FDD_B1, FDD_B2		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)		
	Bands FS3_G		-	(Io for Channel 1 +5.51dB Note9 +10log($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier

aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.1.55.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B1, FDD_B2**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 3)	RSRP_18	RSRP_18	RSRP_19	RSRP_19	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 3)	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34	RSRP_34
Extreme Conditions							
Lowest reported value (Cell 3)	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 3)	RSRP_35	RSRP_36	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39

Table 9.1.55.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 3)	RSRP_x -3
Highest reported value (Cell 3)	RSRP_x + 12
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 3)	RSRP_x – 4
Highest reported value (Cell 3)	RSRP_x + 14
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.56 FS3 Intra frequency absolute and relative RSRP accuracies with TDD PCell

9.1.56.1 Test purpose

To verify that TDD intra frequency RSRP absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRP accuracy requirement of the secondary component carrier and the relative RSRP accuracy requirement of the secondary component carriers. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement.

9.1.56.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward supporting downlink LAA with TDD as PCell.

9.1.56.3 Minimum conformance requirements

RSRP measurement of cells on secondary component carrier with frame structure 3 shall meet the intra frequency absolute accuracy requirements in TS 36.133 [4] section 9.1.18.2.4.

The requirements for absolute accuracy of RSRP in this clause apply to a cell on a serving carrier frequency.

The accuracy requirements in Table 9.1.56.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.1 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.56.3-1: RSRP intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FS3_G	-118	N/A	-70
±8	±11	≥-6 dB	FS3_G	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in TS 36.133 [4] sections 9.1.18.2.5.

The accuracy requirements in Table 9.1.56.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.22.1 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.56.3-2: RSRP intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FS3_G	-118	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in TS 36.133 [4] sections 9.1.18.2.3.

The accuracy requirements in Table 9.1.56.3-3 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.56.3-3: RSRP inter-frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FS3_G	-118	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.56.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.56.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.19.2, clause 9.1.19.3, 9.1.19.4 clause 9.1.4 and A.9.1.56.

9.1.56.4 Test description

9.1.56.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.56.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.56.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.56.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.56.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 3 is compared to actual RSRP value according to Table 9.1.56.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
   The reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell2 and Cell1 for each MeasurementReport message according to Table 9.1.56.5-3. This counts as a Pass or Fail for the events “Cell 2-3” and “Cell 1-3”. If the UE fails to report the measurement value for Cell2 or Cell 3, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 2-3” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration, the test passes. If one event fails, the test fails.

9.1.56.4.3 Message contents

Message contents are the same as in Clause 9.1.55.4.3.

9.1.56.5 Test requirement

Table 9.1.56.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.56.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.56.5-3.

Table 9.1.56.5-1: Test parameters for TDD RSRP accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	40	40
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	C.3.5
Special subframe configuration[Note1]		6	N/A	N/A
Uplink/downlink configuration[Note1]		1	N/A	N/A
Timing offset to cell1	μs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.2 and A.1.6 (R.0 FS3)		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	R.0 FS3	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 and A.2.4		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	R.0 FS3	R.0 FS3

OCNG Patterns defined in D.2 and D.1			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	OP.13 FDD	OP.14 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-117	-	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FS3_G		-	(N_{oc} for Channel 1 +1dB)	
$\hat{E}_s/I_{ot}$		dB	-4	0.09 Note9	-4.96
RSRP Note4	Bands TDD_A	dBm/15 kHz	-121	-	
	Bands TDD_C		-120		
	Bands TDD_E		-119		
	Bands FS3_G		-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
Io Note4	Bands TDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	-87.76 +10log($N_{RB,c}$/50)	-	
	Bands TDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-85.76 +10log($N_{RB,c}$/50)		
	Bands FS3_G		-	(Io for Channel 1 +5.51dB Note9 +10log($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 8:	E-UTRA operating band groups are as defined in Section 3.5.
Note 9:	The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.1.56.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 3)	RSRP_18	RSRP_19	RSRP_20
Highest reported value (Cell 3)	RSRP_31	RSRP_32	RSRP_33
Extreme Conditions			
Lowest reported value (Cell 3)	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 3)	RSRP_35	RSRP_36	RSRP_37

Table 9.1.56.5-3: RSRP TDD Inter frequency relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 3)	RSRP_x -3
Highest reported value (Cell 3)	RSRP_x + 12
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 3)	RSRP_x – 4
Highest reported value (Cell 3)	RSRP_x + 14
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.57 FD-FDD RSRP Intra frequency case for BL/CE UE in CEModeB

9.1.57.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements for FD-FDD intra-frequency RSRP measurements for BL/CE UE in CEModeB.

9.1.57.2 Test applicability

This test applies to all types of E-UTRA FDD BL/CE UE release 13 and forward of UE category M1 and higher. Applicability requires support for CE Mode B and FGI bit 16.

9.1.57.3 Minimum conformance requirements

The Intra-frequency absolute RSRP measurements for UE category M1 shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.21.3. The Intra-frequency relative RSRP measurements for UE category M1 shall meet the relative accuracy requirements defined in TS 36.133 [4] clause 9.1.21.4.

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.57.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.57.3-1: RSRP Intra-frequency absolute accuracy for UE category M1 with CE mode B for FDD and TDD

Accuracy		Conditions				
			Io [Note 1] range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±8	±11	-15≤Ês/Iot≤-12 dB	FDD-M1_A, TDD-M1_A	-121	N/A	-70
			FDD-M1_B	-120.5	-50	
			FDD-M1_D	-119.5	N/A	-70
			FDD-M1_E, TDD-M1_E	-119	N/A	-70
			FDD-M1_F	-118.5	N/A	-70
±7	±10	≥-12 dB	FDD-M1_G	-118	N/A	-70
			FDD-M1_N	-114.5	N/A	-70
±10	±13	-15≤Ês/Iot≤-12 dB	FDD-M1_A, TDD-M1_A, FDD_M1_B, FDD-M1_D, FDD-M1_E, TDD-M1_E, FDD-M1_F, FDD-M1_G, FDD-M1_N	N/A	-70	-50
±9	±12	≥-12 dB				

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.57.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.57.3-2: SRP Intra-frequency relative accuracy for UE category M1 with CE mode B for FDD and TDD

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±4	±4	≥-12 dB	FDD-M1_A, TDD-M1_A	-121	-50
			FDD-M1_B	-120.5	-50
			FDD-M1_D	-119.5	-50
			FDD-M1_E, TDD-M1_E	-119	-50
			FDD-M1_F	-118.5	-50
			FDD-M1_G	-118	-50
			FDD-M1_N	-114.5	-50
±5	±5	-15≤Ês/Iot≤-12 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.57.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.57.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.21.3, 9.1.21.4, 9.1.21.5, 9.1.4 and A.9.1.57.

9.1.57.4 Test description

9.1.57.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clauses B.0.
3. Message contents are defined in clause 9.1.57.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.57.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Table 9.1.57.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. The SS shall transmit the RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. The UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, the SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.57.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRP value of Cell 2 is compared to the reported RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.57.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.57.5-1 as appropriate.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 9.1.57.4.3-1: Common Exception messages for FD-FDD RSRP Intra-frequency case in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.8-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1a with Gap Pattern Id = 0 Table H.3.5-3a Table H.7.1-1

Table 9.1.57.4.3-2: *MeasResults*: Additional FD-FDD RSRP Intra-frequency case in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.57.4.3-3: *MeasResultListEUTRA*: Additional FD-FDD RSRP Intra-frequency case in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.57.5 Test requirement

Table 9.1.57.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.57.7-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.57.7-3.

Table 9.1.57.5-1: FD-FDD RSRP Intra-frequency test parameters in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.22 FDD	-	R.22 FDD	-	R.22 FDD	-
PDSCH allocation		n_{PRB}	Follows R.22 FDD	-	Follows R.22 FDD	-	Follows R.22 FDD	-
MPDCCH Reference measurement channel			R.18 FDD		R.18 FDD		R.18 FDD	
OCNG Patterns			OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD-M1_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands FDD-M1_B						-106.5	
	Bands FDD-M1_C						-106	
	Bands FDD-M1_D						-105.5	
	Bands FDD-M1_E, FDD-M1_F Note 4						-105	
	Bands FDD-M1_G						-104	
	Bands FDD-M1_H						-103.5	
$\hat{E}_s / N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s / I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP Note3	Bands FDD-M1_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands FDD-M1_B						-118.5	-120.4
	Bands FDD-M1_C						-118	-119.9
	Bands FDD-M1_D						-117.5	-119.4
	Bands FDD-M1_E, FDD-M1_F Note 4						-117	-118.9
	Bands FDD-M1_G						-116	-117.9
	Bands FDD-M1_H						-115.5	-117.4
Io Note3	Bands FDD-M1_A	dBm/9 MHz	-71.09		-51.09		-78.79	
	Bands FDD_B						-78.29	
	Bands FDD-M1_C						-77.79	
	Bands FDD-M1_D						-77.29	
	Bands FDD-M1_E, FDD-M1_F Note 4						-76.79	
	Bands FDD-M1_G						-75.79	
	Bands FDD-M1_H						-75.29	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.57.5-2: FD-FDD RSRP Intra-frequency absolute accuracy requirements for the reported values in CEModeB

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_18	RSRP_36	Bands FDD-M1_A	RSRP_10
			Bands FDD-M1_B	RSRP_11
			Bands FDD-M1_C	RSRP_11
			Bands FDD-M1_D	RSRP_12
			Bands FDD-M1_E, FDD-M1_F	RSRP_12
			Bands FDD-M1_G	RSRP_13
			Bands FDD-M1_H	RSRP_14
Highest reported value (Cell 2)	RSRP_37	RSRP_59	Bands FDD-M1_A	RSRP_29
			Bands FDD-M1_B	RSRP_30
			Bands FDD-M1_C	RSRP_30
			Bands FDD-M1_D	RSRP_31
			Bands FDD-M1_E, FDD-M1_F	RSRP_31
			Bands FDD-M1_G	RSRP_32
			Bands FDD-M1_H	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_15	RSRP_33	Bands FDD-M1_A	RSRP_7
			Bands FDD-M1_B	RSRP_8
			Bands FDD-M1_C	RSRP_8
			Bands FDD-M1_D	RSRP_9
			Bands FDD-M1_E, FDD_F	RSRP_9
			Bands FDD-M1_G	RSRP_10
			Bands FDD-M1_H	RSRP_11
Highest reported value (Cell 2)	RSRP_40	RSRP_62	Bands FDD-M1_A	RSRP_32
			Bands FDD-M1_B1	RSRP_33
			Bands FDD-M1_C	RSRP_33
			Bands FDD-M1_D	RSRP_34
			Bands FDD-M1_E, FDD-M1_F	RSRP_34
			Bands FDD-M1_G	RSRP_35
			Bands FDD-M1_H	RSRP_36
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.57.5-3: FD-FDD RSRP Intra-frequency relative accuracy requirements for the reported values in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.58 HD-FDD RSRP Intra frequency case for BL/CE UE in CEModeB

9.1.58.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for HD-FDD intra frequency RSRP measurements for BL/CE UE in CEModeB.

9.1.58.2 Test applicability

This test applies to all types of E-UTRA HD-FDD BL/CE UE release 13 and forward of UE category M1 and higher that support CE Mode B. Applicability requires support for FGI bit 16.

9.1.58.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.57.3 with the following exceptions:

- Instead of Table 9.1.57.3-1 → use Table 9.1.58.3-1.
- Instead of Table 9.1.57.3-2 → use Table 9.1.58.3-2.

Table 9.1.58.3-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode B for HD-FDD

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±8	±11	-15≤Ês/Iot≤-12 dB	FDD-M1_A	-121	N/A	-70
			FDD-M1_B	-120.5	N/A	-70
			FDD-M1_D	-119.5	N/A	-70
			FDD-M1_E	-119	N/A	-70
			FDD-M1_F	-118.5	N/A	-70
±7	±10	≥-12 dB	FDD-M1_G	-118	N/A	-70
			FDD-M1_N	-114.5	N/A	-70
±10	±13	-15≤Ês/Iot≤-12 dB	FDD-M1_A, FDD_M1_B, FDD-M1_D, FDD-M1_E, FDD-M1_F, FDD-M1_G, FDD-M1_N	N/A	-70	-50
±9	±12	≥-12 dB				

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.58.3-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode B for HD-FDD

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±4	±4	≥-12 dB	FDD-M1_A	-121	-50
			FDD-M1_B	-120.5	-50
			FDD-M1_D	-119.5	-50
			FDD-M1_E	-119	-50
			FDD-M1_F	-118.5	-50
			FDD-M1_G	-118	-50
			FDD-M1_N	-114.5	-50
±5	±5	-15≤Ês/Iot≤-12 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.3, 9.1.21.4, 9.1.4, and A.9.1.58.

9.1.58.4 Test description

Same test description as in clause 9.1.57.4 with the following exceptions:

- Instead of Table 9.1.57.5-1 → use Table 9.1.58.5-1.
- Instead of Table 9.1.57.5-2 → use Table 9.1.58.5-2.
- Instead of Table 9.1.57.5-3 → use Table 9.1.58.5-3.

9.1.58.5 Test requirement

Table 9.1.58.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.58.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.58.5-3.

Table 9.1.58.5-1: HD-FDD RSRP Intra frequency test parameters in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.12 HD-FDD	-	R.12 HD-FDD	-	R.12 HD-FDD	-
PDSCH allocation		n_{PRB}	Follows R.12 HD-FDD	-	Follows R.12 HD-FDD	-	Follows R.12 HD-FDD	-
MPDCCH Reference measurement channel			R.8 HD-FDD		R.8 HD-FDD		R.8 HD-FDD	
OCNG Patterns			OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD	OP.21 FDD	OP.6 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD-M1_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands FDD-M1_B						-106.5	
	Bands FDD-M1_C						-106	
	Bands FDD-M1_D						-105.5	
	Bands FDD-M1_E, FDD-M1_F Note 5						-105	
	Bands FDD-M1_G Note 7						-104	
	Bands FDD-M1_H						-103.5	
$\hat{E}_s / N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s / I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP Note3	Bands FDD-M1_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands FDD-M1_B						-118.5	-120.4
	Bands FDD-M1_C						-118	-119.9
	Bands FDD-M1_D						-117.5	-119.4
	Bands FDD-M1_E, FDD-M1_F Note 4						-117	-118.9
	Bands FDD-M1_G Note 6						-116	-117.9
	Bands FDD-M1_H						-115.5	-117.4
Io Note3	Bands FDD-M1_A	dBm/9 MHz	-71.79		-51.79		-78.79	
	Bands FDD-M1_B						-78.29	
	Bands FDD-M1_C						-77.79	
	Bands FDD-M1_D						-77.29	
	Bands FDD-M1_E, FDD-M1_F Note 4						-76.79	
	Bands FDD-M1_G Note 6						-75.79	
	Bands FDD-M1_H						-75.29	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.1.58.5-2: HD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values in CEModeB

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_18	RSRP_36	Bands FDD-M1_A	RSRP_10
			Bands FDD-M1_B	RSRP_11
			Bands FDD-M1_C	RSRP_11
			Bands FDD-M1_D	RSRP_12
			Bands FDD-M1_E, FDD-M1_F	RSRP_12
			Bands FDD-M1_G	RSRP_13
			Bands FDD-M1_H	RSRP_14
Highest reported value (Cell 2)	RSRP_37	RSRP_59	Bands FDD-M1_A	RSRP_29
			Bands FDD-M1_B	RSRP_30
			Bands FDD-M1_C	RSRP_30
			Bands FDD-M1_D	RSRP_31
			Bands FDD-M1_E, FDD-M1_F	RSRP_31
			Bands FDD-M1_G	RSRP_32
			Bands FDD-M1_H	RSRP_33
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_15	RSRP_33	Bands FDD-M1_A	RSRP_7
			Bands FDD-M1_B	RSRP_8
			Bands FDD-M1_C	RSRP_8
			Bands FDD-M1_D	RSRP_9
			Bands FDD-M1_E, FDD-M1_F	RSRP_9
			Bands FDD-M1_G	RSRP_10
			Bands FDD-M1_H	RSRP_11
Highest reported value (Cell 2)	RSRP_40	RSRP_62	Bands FDD-M1_A	RSRP_32
			Bands FDD-M1_B	RSRP_33
			Bands FDD-M1_C	RSRP_33
			Bands FDD-M1_D	RSRP_34
			Bands FDD-M1_E, FDD-M1_F	RSRP_34
			Bands FDD-M1_G	RSRP_35
			Bands FDD-M1_H	RSRP_36
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.58.5-3: HD-FDD RSRP Intra frequency relative accuracy requirements for the reported values in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal and Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.59 TDD RSRP Intra frequency case for BL/CE UE in CEModeB

9.1.59.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements for TDD Intra-frequency RSRP measurements for BL/CE UE in CEModeB.

9.1.59.2 Test applicability

This test applies to all types of E-UTRA TDD BL/CE UE release 13 and forward of UE category M1 and higher. Applicability requires support for CE Mode B and FGI bit 16.

9.1.59.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.57.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.21.3, clause 9.1.21.4, clause 9.1.21.5 and A.9.1.59.

9.1.59.4 Test description

9.1.59.4.1 Initial conditions

Same initial conditions as in clause 9.1.57.4.1.

9.1.59.4.2 Test procedure

Same test procedure as in clause 9.1.57.4.2 with following exceptions:

- Instead of Table 9.1.57.5-1 → use Table 9.1.59.5-1.
- Instead of Table 9.1.57.5-2 → use Table 9.1.59.5-2.
- Instead of Table 9.1.57.5-2 → use Table 9.1.59.5-2.

9.1.59.4.3 Message contents

Same message content as in clause 9.1.57.4.3.

9.1.59.5 Test requirement

Table 9.1.59.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.59.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.59.5-3.

Table 9.1.59.5-1: TDD RSRP Intra-frequency test parameters in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in clause A.8.6			R.18 TDD	-	R.18 TDD	-	R.18 TDD	-
PDSCH allocation		n_{PRB}	Follows R.18 TDD	-	Follows R.18 TDD	-	Follows R.18 TDD	-
MPDCCH Reference measurement channel defined in clause A.7.6			R.16 TDD		R.16 TDD		R.16 TDD	
OCNG Patterns defined in clause D.2			OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD-M1_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands TDD-M1_C						-106	
	Bands TDD-M1_E						-105	
$\hat{E}_s / N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s / I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP[Note4]	Bands TDD-M1_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands TDD-M1_C						-118	-119.9
	Bands TDD-M1_E						-117	-118.9
Io[Note4]	Bands TDD-M1_A	dBm/9 MHz	-71.09		-51.09		-78.79	
	Bands TDD-M1_C						-77.79	
	Bands TDD-M1_E						-76.79	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.59.5-2: TDD RSRP Intra-frequency absolute accuracy requirements for the reported values in CEModeB

Normal Conditions	Event		Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	Cell 2	Bands TDD-M1_A	RSRP_18	RSRP_36	RSRP_10
		Bands TDD-M1_C			RSRP_11
		Bands TDD-M1_E			RSRP_12
Highest reported value (Cell 2)	Cell 2	Bands TDD-M1_A	RSRP_37	RSRP_59	RSRP_29
		Bands TDD-M1_C			RSRP_30
		Bands TDD-M1_E			RSRP_31
Extreme Conditions	**Event**		**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	Cell 2	Bands TDD-M1_A	RSRP_15	RSRP_33	RSRP_7
		Bands TDD-M1_C			RSRP_8
		Bands TDD-M1_E			RSRP_9
Highest reported value (Cell 2)	Cell 2	Bands TDD-M1_A	RSRP_40	RSRP_62	RSRP_32
		Bands TDD-M1_C			RSRP_33
		Bands TDD-M1_E			RSRP_34

Table 9.1.59.5-3: TDD RSRP Intra-frequency relative accuracy requirements for the reported values in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.60 FS3 Absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal with FDD PCell

9.1.60.1 Test purpose

The purpose of this test is to verify that CSI- RSRP measurement accuracy is within the specified limits. This test will verify the absolute intra-frequency CSI-RSRP accuracy requirements of the SCells defined in TS 36.133 Section 9.1.18.4.4 for intra-frequency measurements under FS3, and the relative intra-frequency CSI-RSRP accuracy requirements between SCells defined in TS 36.133 section 9.1.18.4.5.

9.1.60.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support downlink LAA with FDD as PCell and IE csi-RS-DRS-RRM-MeasurementsLAA-r13.

9.1.60.3 Minimum conformance requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on a serving carrier frequency operating under frame structure 3.

The accuracy requirements in Table 9.1.60.3-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in TS 36.133 Annex B.3.21.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.60.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	CSI Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥0 dB	FS3_G	-118	N/A	-70
±8	±11	≥0 dB	FS3_G	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP operating under frame structure 3. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.60.3-2 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in TS 36.133 Annex B.3.22.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.60.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	CSI Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥ 0 dB	FS3_G	-118	-50
±3	±3	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.60.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.60.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.4.1, 9.1.18.4.4, 9.1.18.4.5 and A.9.1.60.

9.1.60.4 Test description

9.1.60.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.60.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure group A.41 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.89 (without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.60.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 using FS3 is SCell on the secondary component carrier and activated, and Cell 3 using FS3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.60.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2)
5. Set the parameters according to Table 9.1.60.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.60.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 3 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.60.5-2. This counts as a Pass or Fail for the event “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 3 is compared to the reported CSI-RSRP value of Cell 2 for each MeasurementReport message according to Table 9.1.60.5-3. This counts as a Pass or Fail for the event “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations is increased by one.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2”, “Cell 3” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.60.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.60.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-3 without MeasDS config for PCell Table H.3.8-4 Table H.3.8-5

Table 9.1.60.4.3-2: Void

Table 9.1.60.4.3-3: *MeasDS-Config-DEFAULT-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	1		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 3	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	6		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.60.4.3-4: Void

Table 9.1.60.4.3-5: *MeasResults-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 2	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 3	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.60.5 Test requirement

Table 9.1.60.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP intra frequency with FS3 SCell and FS3 Neighbouring Cell absolute accuracy shall meet the reported values test requirements in Table 9.1.60.5-2.

The CSI-RSRP intra frequency with FS3 SCell and FS3 Neighbouring Cell relative accuracy shall meet the reported values test requirements in Table 9.1.60.5-3.

Table 9.1.60.5-1: CSI-RSRP carrier aggregation test parameters with FDD PCell and FS3 SCells

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
Frame structure			FDD	FS3	FS3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	5 MHz: $N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100
Timing offset to Cell 1		µs	-	0	3
Uplink/downlink configuration			-	Note10	Note10
Time alignment error relative to cell 1 Note 11			-	≤ TAE	-
DMTC period		ms	-	40	40
DMTC period offset		ms	-	10	10
Discovery signal occasion duration		ms	-	1	1
CSI-RS resource configuration			-	1	6
CSI-RS subframe offset		ms	-	0	0
CSI-RS individual offset[2]		dB	-	0	0
LBT model			-	-	C.3.5
Measurement bandwidth		n_{PRB}	5 MHz: 10—15 10 MHz: 22—27 20 MHz: 47—52	47—52	47—52
PDSCH Reference measurement channel defined in A.1			5 MHz: R.5 FDD 10 MHz: R.0 FDD 20 MHz: R.4 FDD	R.0 FS3	-
PDSCH allocation		n_{PRB}	5 MHz: 7-17 10 MHz: 13-36 20 MHz: 38-61	38—61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2			5 MHz: R.11 FDD 10 MHz: R.6 FDD 20 MHz: R.10 FDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in D.1			5 MHz: OP.15 FDD 10 MHz: OP.1 FDD 20 MHz: OP.11 FDD	OP.13 FDD	OP.14 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	-	-
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
	Bands FS3_G		-	(N_{oc} for Channel 1 + 1 dB)	
CRS $\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	-	6.46	1.04

RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-121		
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
	Bands FS3_G		-	RSRP for Cell 1 + 8 dB)	RSRP for Cell 1 + 4 dB)
CSI-RSRP[Note3]		dBm/15 kHz		-	-
	Bands FS3_G		-	RSRP for Cell 2 + 6 dB)	RSRP for Cell 3 + 6.8 dB)
Io[Note3]	Bands FDD_A	dBm/ $BW_{channel}$	$-87.76+10\log(N_{RB,c}/50)$	-	-
	Bands FDD_B1, FDD_B2		$-87.26+10\log(N_{RB,c}/50)$		
	Bands FDD_C		$-86.76+10\log(N_{RB,c}/50)$		
	Bands FDD_D		$-86.26+10\log(N_{RB,c}/50)$		
	Bands FDD_E, FDD_F Note 6		$-85.76+10\log(N_{RB,c}/50)$		
	Bands FDD_G		$-84.76+10\log(N_{RB,c}/50)$		
	Bands FDD_H		$-84.26+10\log(N_{RB,c}/50)$		
	Bands FS3_G		-	(Io for Channel 1 + 5.33 dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
CRS $\hat{E}_s / N_{oc}$		dB	-4	3	-1
CSI-RS $\hat{E}_s / N_{oc}$		dB	-	9	5.8
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Void

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Note 10: Downlink only configuration

Note 11: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.1.60.5-2: CSI-RSRP Intra frequency with FDD PCell and FS3 SCells absolute accuracy requirements for the reported values

	Event	Operating band of Cell 1						
		Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_28	CSI_RSRP_29	CSI_RSRP_29	CSI_RSRP_30	CSI_RSRP_31
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_43
Lowest reported value (Cell 3)	Cell 3	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26	CSI_RSRP_27	CSI_RSRP_28
Highest reported value (Cell 3)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40
Extreme Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_45	CSI_RSRP_46	CSI_RSRP_46	CSI_RSRP_47	CSI_RSRP_48
Lowest reported value (Cell 3)	Cell 3	CSI_RSRP_20	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23	CSI_RSRP_23
Highest reported value (Cell 3)		CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_44	CSI_RSRP_44

Table 9.1.60.5-3: CSI-RSRP Intra frequency with FDD PCell and FS3 SCells relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 - 7
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 - 1
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 - 8
Highest reported value (Cell 3)		CSI_RSRP_Cell 2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.61 FS3 Absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal with TDD PCell

9.1.61.1 Test purpose

The purpose of this test is to verify that CSI- RSRP measurement accuracy is within the specified limits. This test will verify the absolute intra-frequency CSI-RSRP accuracy requirements of the SCells defined in TS 36.133 Section 9.1.18.4.4 for intra-frequency measurements under FS3, and the relative intra-frequency CSI-RSRP accuracy requirements between SCells defined in TS 36.133 section 9.1.18.4.5.

9.1.61.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support downlink LAA with TDD as PCell and IE csi-RS-DRS-RRM-MeasurementsLAA-r13.

9.1.61.3 Minimum conformance requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on a serving carrier frequency operating under frame structure 3.

The accuracy requirements in Table 9.1.61.3-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in TS 36.133 Annex B.3.21.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.61.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	CSI Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥0 dB	FS3_G	-118	N/A	-70
±8	±11	≥0 dB	FS3_G	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP operating under frame structure 3. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.61.3-2 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in TS 36.133 Annex B.3.22.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.61.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	CSI Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥ 0 dB	FS3_G	-118	-50
±3	±3	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.61.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.61.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.4.1, 9.1.18.4.4, 9.1.18.4.5 and A.9.1.61.

9.1.61.4 Test description

9.1.61.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.61.5-1 as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure group A.41 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.89 (without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.61.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 using FS3 is SCell on the secondary component carrier and activated, and Cell 3 using FS3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.61.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2)
5. Set the parameters according to Table 9.1.61.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.61.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 3 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.61.5-2. This counts as a Pass or Fail for the event “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 3 is compared to the reported CSI-RSRP value of Cell 2 for each MeasurementReport message according to Table 9.1.61.5-3. This counts as a Pass or Fail for the event “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 and Cell 3, the number of failed iterations is increased by one.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2”, “Cell 3” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.61.4.3 Message contents

Message contents are the same as in Clause 9.1.60.4.3.

Table 9.1.61.4.3-1: Void

9.1.61.5 Test requirement

Table 9.1.61.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP intra frequency with FS3 SCell and FS3 Neighbouring Cell absolute accuracy shall meet the reported values test requirements in Table 9.1.61.5-2.

The CSI-RSRP intra frequency with FS3 SCell and FS3 Neighbouring Cell relative accuracy shall meet the reported values test requirements in Table 9.1.61.5-3.

Table 9.1.61.5-1: CSI-RSRP carrier aggregation test parameters with TDD PCell and FS3 SCells

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
Frame structure			TDD	FS3	FS3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100
Timing offset to Cell1		µs	-	0	3
Special subframe configuration Note1			6	Note10	Note10
Uplink/downlink configuration Note1			1	Note10	Note10
Time alignment error relative to cell 1 Note 11			-	≤ TAE	-
DMTC period		ms	-	40	40
DMTC period offset		ms	-	10	10
Discovery signal occasion duration		ms	-	1	1
CSI-RS resource configuration			-	1	6
CSI-RS subframe offset		ms	-	0	0
CSI-RS individual offset[2]		dB	-	0	0
LBT model			-	-	C.3.5
Measurement bandwidth		n_{PRB}	5 MHz: 10—15 10 MHz: 22—27 20 MHz: 47—52	47—52	47—52
PDSCH Reference measurement channel defined in A.1			5 MHz: R.4 TDD 10 MHz: R.0 TDD 20 MHz: R.3 TDD	R.0 FS3	-
PDSCH allocation		n_{PRB}	5 MHz: 7-17 10 MHz: 13-36 20 MHz: 38-61	38—61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2			5 MHz: R.11 TDD 10 MHz: R.6 TDD 20 MHz: R.10 TDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in D.2 and D.1			5 MHz: OP.9 TDD 10 MHz: OP.1 TDD 20 MHz: OP.7 TDD	OP.13 FDD	OP.14 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-117	-	-
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FS3_G		-	(N_{oc} for Channel 1 + 1 dB)	
CRS $\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	-	6.46	1.04
RSRP Note3	Bands TDD_A	dBm/15 kHz	-121	-	-
	Bands TDD_C		-120		
	Bands TDD_E		-119		

	Bands FS3_G		-	RSRP for Cell 1 + 8 dB)	RSRP for Cell 1 + 4 dB)
CSI-RSRP Note3		dBm/15 kHz			
	Bands FS3_G		-	RSRP for Cell 2 + 6 dB)	RSRP for Cell 3 + 6.8 dB)
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	$-87.76+10\log(N_{RB,c}/50)$	-	-
	Bands TDD_C		$-86.76+10\log(N_{RB,c}/50)$		
	Bands TDD_E		$-85.76+10\log(N_{RB,c}/50)$		
	Bands FS3_G		-	(Io for Channel 1 + 5.33 dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
CRS $\hat{E}_s / N_{oc}$		dB	-4	3	-1
CSI-RS $\hat{E}_s / N_{oc}$		dB	-	9	5.8
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2

Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: Void

Note 7: Void

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS 36.331) before the beginning of the test.

Note 10: Downlink only configuration

Note 11: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.1.61.5-2: CSI-RSRP Intra frequency with TDD PCell and FS3 SCells absolute accuracy requirements for the reported values

	Event	Operating band of Cell 1		
		Bands TDD_A	Bands FDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_29
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_42
Lowest reported value (Cell 3)	Cell 3	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26
Highest reported value (Cell 3)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_38
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_25
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_46
Lowest reported value (Cell 3)	Cell 3	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22
Highest reported value (Cell 3)		CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43

Table 9.1.61.5-3: CSI-RSRP Intra frequency with TDD PCell and FS3 SCells relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 - 7
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 - 1
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 - 8
Highest reported value (Cell 3)		CSI_RSRP_Cell 2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.62 to 9.1.67

9.1.68 3DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes

9.1.68.1 Test purpose

To verify that absolute and relative RSRP measurement accuracy requirements in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.68.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 3DL CA.

Note on the applicability: If the generic duplex-mode test case 9.1.68 is tested with FDD PCell, the specific duplex-mode test cases 9.1.37 and 9.1.39 do not need to be tested. If the generic duplex-mode test case 9.1.68 is tested with TDD PCell, the specific duplex-mode test cases 9.1.38 and 9.1.40 do not need to be tested

9.1.68.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.68.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP_{|dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.68.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.68.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2_{|dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.68.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.68.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.68.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.68.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.46.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.68.

9.1.68.4 Test description

9.1.68.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.68.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure A.66a as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.68.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on SCC1, and Cell 3 is the neighbouring cell on SCC1. Cell 4 is SCell on SCC2, and Cell 5 is the neighbouring cell on SCC2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

9.1.68.4.2 Test procedure

Test equipment shall select either baseline test method or alternative test method. Applied test method shall be identified in the test result.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 ,C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2 and Cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.68.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 9.1.68.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

Baseline test method:

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2 and Cell 4 are compared to the actual RSRP values according to Table 9.1.68.5-2. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 4”. If the UE fails to report the measurement value for Cell 2 or Cell 4, the number of failed iterations for the respective event is increased by one.

   The reported RSRP values for Cell 2, Cell 3, Cell 4 and Cell 5 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.68.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 2-3” and “Cell 4-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Alternative test method:

9. The neighbouring cell specified in Table 9.1.68.4.2-1 shall be powered ON and other neighbouring cells shall be powered OFF.

10. After 10s wait from Step 9, SS shall check the reported RSRP values in periodical MeasurementReport messages.

    The reported RSRP values for cells specified in Table 9.1.68.4.2-1 are compared to the actual RSRP values according to Table 9.1.68.5-2 and Table 9.1.68.5-3 . This counts respectively as a Pass or Fail for the events specified in Table 9.1.68.4.2-1. If the UE fails to report the measurement value for cells in Table 9.1.68.4.2-1, the number of failed iterations for the respective event is increased by one.

11. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

12. Repeat Step 9 – 11 for each remaining rows of Table 9.1.68.4.2-1.

13. If test configuration is Inter-band carrier aggregation, repeat steps 1-12 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Table 9.1.68.4.2-1: Test configuration for the alternative test method

ID	Configured ServingCells	Configured NeighCell	Measured Cells	Measured Events
1	Cell 1, Cell 2, Cell 4	Cell 3	Cell 1, Cell 2, Cell 3	Cell 1, Cell 2, Cell 1-2, Cell 2-3
2		Cell 5	Cell 1, Cell 4, Cell 5	Cell 4, Cell 1-4, Cell 4-5

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 1-2”, “Cell 1-4”, “Cell 2-3”and “Cell 4-5 is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.68.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.68.4.3-1: Common Exception messages for 3DL RSRP Accuracy for E-UTRA Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.68.5 Test requirement

Tables 9.1.68.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy test shall meet the reported values test requirements in table 9.1.68.5-2.

The RSRP relative accuracy test shall meet the reported values test requirements in table 9.1.68.5-3.

Table 9.1.68.5-1: 3 DL RSRP carrier aggregation test parameters for cell 1, cell 2, Cell3, Cell4 and cell 5

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number		1	2		3	
Duplex mode		FDD or TDD	FDD or TDD		FDD or TDD	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
TDD Special subframe configuration[Note1]		6	6		6	
TDD Uplink/downlink configuration[Note1]		1	1		1	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.		5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	-	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.		5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD
OCNG Patterns defined in Annex D.		5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.16 FDD 10MHz FDD: OP.2 FDD 20MHz FDD: OP.12 FDD 5MHz TDD: OP.10 TDD 10MHz TDD: OP.2 TDD 20MHz TDD: OP.8 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.16 FDD 10MHz FDD: OP.2 FDD 20MHz FDD: OP.12 FDD 5MHz TDD: OP.10 TDD 10MHz TDD: OP.2 TDD 20MHz TDD: OP.8 TDD
PBCH_RA	dB	0	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						

OCNG_RA[Note2]							
OCNG_RB[Note2]							
N_{oc} [Note3]	Bands TDD_A	dBm/ 15kHz	-117	(N_{oc} for Channel 1 +1dB)		(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116				
	Bands TDD_E		-115				
	Bands FDD_A		-117				
	Bands FDD_B1, FDD_B2 [Note 10]		-116.5				
	Bands FDD_C		-116				
	Bands FDD_D		-115.5				
	Bands FDD_E, FDD_F [Note 7]		-115				
	Bands FDD_G		-114				
	Bands FDD_H		-113.5				
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/ 15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120				
	Bands TDD_E		-119				
	Bands FDD_A		-121				
	Bands FDD_B1, FDD_B2 [Note 10]		-120.5				
	Bands FDD_C		-120				
	Bands FDD_D		-119.5				
	Bands FDD_E, FDD_F [Note 7]		-119				
	Bands FDD_G		-118				
	Bands FDD_H		-117.5				
Io[Note4]	Bands TDD_A	dBm/ $BW_{channel}$	-87.76+10log($N_{RB,c}$/50)	(Io for Channel 1+5.51dB+10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1+5.51dB+10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-86.76+10log($N_{RB,c}$/50)				
	Bands TDD_E		-85.76+10log($N_{RB,c}$/50)				
	Bands FDD_A		-87.76+10log($N_{RB,c}$/50)				
	Bands FDD_B1, FDD_B2 [Note 10]		-87.26+10log($N_{RB,c}$/50)				
	Bands FDD_C		-86.76+10log($N_{RB,c}$/50)				
	Bands FDD_D		-86.26+10log($N_{RB,c}$/50)				
	Bands FDD_E, FDD_F [Note 7]		-85.76+10log($N_{RB,c}$/50)				
	Bands FDD_G		-84.76+10log($N_{RB,c}$/50)				
	Bands FDD_H		-84.26+10log($N_{RB,c}$/50)				
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3
Time alignment error relative to cell 1 [Note 8]			-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2[Note 8]			-	-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.1.68.5-2: RSRP Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42

Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.

Table 9.1.68.5-3: RSRP Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.69 4 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes

9.1.69.1 Test purpose

To verify that absolute and relative RSRP measurement accuracy requirements in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.69.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 4DL CA.

Note on the applicability: If the generic duplex-mode test case 9.1.69 is tested with FDD PCell, the specific duplex-mode test cases 9.1.44 and 9.1.46 do not need to be tested. If the generic duplex-mode test case 9.1.69 is tested with TDD PCell, the specific duplex-mode test cases 9.1.45 and 9.1.47 do not need to be tested

9.1.69.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.69.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP_{|dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.69.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range			
			E-UTRA operating band groups [Note 3]	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz [Note 2]	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.69.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.69.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.69.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.46.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.69.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.46.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.69.

9.1.69.4 Test description

9.1.69.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-5 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.69.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure A.66a as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.69.4.3.

4. Cell 1 is PCell on channel 1, and Cell 2, Cell 4 and Cell 6 are activated SCells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 3, Cell 5 and Cell 7 are neighbouring cells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 shall be powered OFF.

9.1.69.4.2 Test procedure

Test equipment shall select either baseline test method or alternative test method. Applied test method shall be identified in the test result.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4 and Cell6) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.69.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 9.1.69.5-1, 9.1.69.5-2 and 9.1.69.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

Baseline test method:

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4 and Cell 6 are compared to the actual RSRP values according to Table 9.1.69.5-4. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 4” and Cell 6. If the UE fails to report the measurement value for Cell 2, Cell 4 or Cell 6, the number of failed iterations for the respective event is increased by one.

   The reported RSRP values for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.69.5-5. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 2-3”, “Cell 4-5” and “Cell 6-7”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 or Cell 7, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-5 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Alternative test method:

9. The neighbouring cell specified in Table 9.1.69.4.2-1 shall be powered ON and other neighbouring cells shall be powered OFF.

10. After 10s wait from Step 9, SS shall check the reported RSRP values in periodical MeasurementReport messages.

    The reported RSRP values for cells specified in Table 9.1.69.4.2-1 are compared to the actual RSRP values according to Table 9.1.69.5-4. This counts respectively as a Pass or Fail for the events specified in Table 9.1.69.4.2-1. If the UE fails to report the measurement value for cells in Table 9.1.69.4.2-1, the number of failed iterations for the respective event is increased by one.

11. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

12. Repeat Step 9 – 11 for each remaining rows of Table 9.1.69.4.2-1.

13. If test configuration is Inter-band carrier aggregation, repeat steps 1-12 for all relevant PCell/SCells scenarios defined in Table E-5 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Table 9.1.69.4.2-1: Test configuration for the alternative test method

ID	Configured ServingCells	Configured NeighCell	Measured Cells	Measured Events
1	Cell 1, Cell 2, Cell 4, Cell 6	Cell 3	Cell 1, Cell 2, Cell 3	Cell 1, Cell 2, Cell 1-2, Cell 2-3
2		Cell 5	Cell 1, Cell 4, Cell 5	Cell 4, Cell 1-4, Cell 4-5
3		Cell 7	Cell 1, Cell 6, Cell 7	Cell 6, Cell 1-6, Cell 6-7

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 2-3”, “Cell 4-5”, and “Cell 6-7” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.69.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.69.4.3-1: Common Exception messages for RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.69.5 Test requirement

Tables 9.1.69.5-1, 9.1.69.5-2 and 9.1.69.5-3 define the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy test shall meet the reported values test requirements in table 9.1.69.5-4.

The RSRP relative accuracy test shall meet the reported values test requirements in table 9.1.69.5-5.

Table 9.1.69.5-1: 4 DL RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
Duplex Mode			FDD or TDD	FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note1]					
OCNG_RB[Note1]					
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FDD_A		-117		
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F [Note 6]		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		

$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96
RSRP Note3	Bands TDD_A	dBm/ 15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
	Bands FDD_A		-121		
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	-87.76 +10log($N_{RB,c}$/50)	(Io for Channel 1 +5.5dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-87.76 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_A		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_B1, FDD_B2		-87.26 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤ TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.69.5-2: 4 DL RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			

$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0. 09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB ±TT +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.69.5-3: 4 DL RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2

$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-
Time alignment error relative to cell 4[Note 7]			≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.69.5-4: RSRP Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_35	RSRP_37	RSRP_37
Lowest reported value (Cell 6)	Cell 6	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 6)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 6)	Cell 6	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 6)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42

Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.

Table 9.1.69.5-5: RSRP Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + 2
Highest reported value (Cell 6)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 - 1
Highest reported value (Cell 6)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 - 8
Highest reported value (Cell 7)		RSRP_Cell 6 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.70 5 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes

9.1.70.1 Test purpose

To verify that RSRP absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.70.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, E-UTRA TDD and 5DL CA.

Note on the applicability: If the generic duplex-mode test case 9.1.70 is tested with FDD PCell, the specific duplex-mode test cases 9.1.48 and 9.1.50 do not need to be tested. If the generic duplex-mode test case 9.1.70 is tested with TDD PCell, the specific duplex-mode test cases 9.1.49 and 9.1.51 do not need to be tested

9.1.70.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.70.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP$|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.70.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.70.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.70.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.70.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.70.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.70.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.70.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.70.

9.1.70.4 Test description

9.1.70.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.70.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure A.66a as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx..

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.70.4.3.

4. Cell 1 is PCell on the primary component carrier, and Cell 2, Cell 4, Cell6, and Cell 8 are activated SCells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 3, Cell 5, Cell7 and Cell 9 are neighbouring cells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell7, Cell8, and Cell 9 shall be powered OFF.

9.1.70.4.2 Test procedure

Test equipment shall select either baseline test method or alternative test method. Applied test method shall be identified in the test result.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4, Cell6, and Cell 8) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.70.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.70.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

Baseline test method:

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4, Cell 6, and Cell 8 are compared to the actual RSRP values according to Table 9.1.70.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, and “Cell 8”. If the UE fails to report the measurement value for Cell 2 or Cell 4 or Cell 6 or Cell 8, the number of failed iterations for the respective event is increased by one.

   The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell5, Cell 6, Cell 7, Cell 8, and Cell 9 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.70.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, and “Cell 8-9”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell6, Cell 7, Cell 8, or Cell 9, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Alternative test method:

9. The neighbouring cell specified in Table 9.1.70.4.2-1 shall be powered ON and other neighbouring cells shall be powered OFF.

10. After 10s wait from Step 9, SS shall check the reported RSRP values in periodical MeasurementReport messages.

    The reported RSRP values for cells specified in Table 9.1.70.4.2-1 are compared to the actual RSRP values according to Table 9.1.70.5-2. This counts respectively as a Pass or Fail for the events specified in Table 9.1.70.4.2-1. If the UE fails to report the measurement value for cells in Table 9.1.70.4.2-1, the number of failed iterations for the respective event is increased by one.

11. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

12. Repeat Step 9 – 11 for each remaining rows of Table 9.1.70.4.2-1.

Table 9.1.70.4.2-1: Test configuration for the alternative test method

ID	Configured ServingCells	Configured NeighCell	Measured Cells	Measured Events
1	Cell 1, Cell 2, Cell 4, Cell 6, Cell 8	Cell 3	Cell 1, Cell 2, Cell 3	Cell 1, Cell 2, Cell 1-2, Cell 2-3
2		Cell 5	Cell 1, Cell 4, Cell 5	Cell 4, Cell 1-4, Cell 4-5
3		Cell 7	Cell 1, Cell 6, Cell 7	Cell 6, Cell 1-6, Cell 6-7
4		Cell 9	Cell 1, Cell 8, Cell 9	Cell 8, Cell 1-8, Cell 8-9

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 8”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, and “Cell 8-9” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.70.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.70.4.3-1: Common Exception messages for RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.70.5 Test requirement

Table 9.1.70.5-1, Table 9.1.70.5-2, Table 9.1.70.5-3 and Table 9.1.70.5-4 define the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.70.5-5.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.70.5-6.

Table 9.1.70.5-1: 5 DL RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
Duplex Mode			FDD or TDD	FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands TDD_A	dBm/ 15kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FDD_A		-117		
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		

$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96
RSRP Note3	Bands TDD_A	dBm/ 15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
	Bands FDD_A		-121		
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	-87.76 +10log($N_{RB,c}$/50)	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-87.76 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_A		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_B1, FDD_B2		-87.26 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤ TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.70.5-2: 5 DL RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			

$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-
Time alignment error relative to cell 4[Note 7]			≤ TAE	-
Time alignment error relative to cell 6[Note 7]			≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.70.5-3: 5 DL RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2

$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-
Time alignment error relative to cell 4[Note 7]			≤ TAE	-
Time alignment error relative to cell 6[Note 7]			≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.70.5-4: 5 DL RSRP carrier aggregation test parameters for cell 8 and cell 9

Parameter		Unit	Cell 8	Cell 9
E-UTRA RF Channel Number			5	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2

$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-
Time alignment error relative to cell 4[Note 7]			≤ TAE	-
Time alignment error relative to cell 6[Note 7]			≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.70.5-5: RSRP Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 6)	Cell 6	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 6)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 8)	Cell 8	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 8)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 6)	Cell 6	RSRP_174	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 6)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 8)	Cell 8	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 8)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.											

Table 9.1.70.5-6: RSRP Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + 2
Highest reported value (Cell 6)		RSRP_Cell 1 + 15
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + 2
Highest reported value (Cell 8)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
1Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 - 1
Highest reported value (Cell 6)		RSRP_Cell 1 + 17
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 - 1
Highest reported value (Cell 8)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 - 8
Highest reported value (Cell 7)		RSRP_Cell 6 + 1
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 - 8
Highest reported value (Cell 9)		RSRP_Cell 8 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.71 6 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Applicability needs to be added to TS 36.521-2

9.1.71.1 Test purpose

To verify that RSRP absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.71.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 6DL CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 6DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, E-UTRA TDD and 6DL CA.

Note on the applicability: If the generic duplex-mode test case 9.1.71 is tested with FDD PCell, the specific duplex-mode test cases 9.1.48 and 9.1.50 do not need to be tested. If the generic duplex-mode test case 9.1.71 is tested with TDD PCell, the specific duplex-mode test cases 9.1.49 and 9.1.51 do not need to be tested

9.1.71.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.71.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.71.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_B1, FDD_B2	-120.5 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
			FDD_N	-114.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.(TS 36.521-3 Section 3.5)

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2.

The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.71.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.71.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.71.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.71.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.71.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.71.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.71.

9.1.71.4 Test description

9.1.71.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-7 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.71.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure A.66a as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.71.4.3.

4. Cell 1 is PCell on the primary component carrier, and Cell 2, Cell 4, Cell 6, Cell 8 and Cell 10 are activated SCells on secondary component carriers SCC1, SCC2, SCC3, SCC4 and SCC5 respectively. Cell 3, Cell 5, Cell7, Cell 9 and Cell 11 are neighbouring cells on secondary component carriers SCC1, SCC2, SCC3, SCC4 and SCC5 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell7, Cell8, Cell9, Cell10 and Cell 11 shall be powered OFF.

9.1.71.4.2 Test procedure

Test equipment shall select either baseline test method or alternative test method. Applied test method shall be identified in the test result.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4, Cell 6, Cell 8and Cell 10) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.71.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.71.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.

Baseline test method:

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

The reported RSRP values for Cell 1, Cell 2, Cell 4, Cell 6, Cell 8 and Cell 10 are compared to the actual RSRP values according to Table 9.1.71.5-6. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 8” and “Cell 10”. If the UE fails to report the measurement value for Cell 2 or Cell 4 or Cell 6 or Cell 8, Cell 10 the number of failed iterations for the respective event is increased by one.

The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell5, Cell 6, Cell 7, Cell 8, Cell 9, Cell 10 and Cell 11 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.71.5-7. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 1-10”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, “Cell 8-9”.and “Cell 10-11”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell6, Cell 7, Cell 8, Cell 9, Cell 10 or Cell 11, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Alternative test method:

9. The neighbouring cell specified in Table 9.1.71.4.2-1 shall be powered ON and other neighbouring cells shall be powered OFF.
10. After 10s wait from Step 9, SS shall check the reported RSRP values in periodical MeasurementReport messages.

The reported RSRP values for cells specified in Table 9.1.71.4.2-1 are compared to the actual RSRP values according to Table 9.1.71.5-6. This counts respectively as a Pass or Fail for the events specified in Table 9.1.71.4.2-1. If the UE fails to report the measurement value for cells in Table 9.1.71.4.2-1, the number of failed iterations for the respective event is increased by one.

11. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
12. Repeat Step 9 – 11 for each remaining rows of Table 9.1.71.4.2-1.

Table 9.1.71.4.2-1: Test configuration for the alternative test method

ID	Configured ServingCells	Configured NeighCell	Measured Cells	Measured Events
1	Cell 1, Cell 2, Cell 4, Cell 6, Cell 8, Cell 10	Cell 3	Cell 1, Cell 2, Cell 3	Cell 1, Cell 2, Cell 1-2, Cell 2-3
2		Cell 5	Cell 1, Cell 4, Cell 5	Cell 4, Cell 1-4, Cell 4-5
3		Cell 7	Cell 1, Cell 6, Cell 7	Cell 6, Cell 1-6, Cell 6-7
4		Cell 9	Cell 1, Cell 8, Cell 9	Cell 8, Cell 1-8, Cell 8-9
5		Cell 11	Cell 1, Cell 10, Cell 11	Cell 10, Cell 1-10, Cell 10-11

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 8”, “Cell 10”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 1-10”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, “Cell 8-9” and “Cell 10-11” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.71.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.71.4.3-1: Common Exception messages for RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.71.5 Test requirement

Table 9.1.71.5-1, Table 9.1.71.5-2, Table 9.1.71.5-3, Table 9.1.71.5-4 and Table 9.1.71.5-5 define the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.71.5-6.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.71.5-7.

Table 9.1.71.5-1: 6 DL RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
Duplex Mode			FDD or TDD	FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note1]					
OCNG_RB[Note1]					
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FDD_A		-117		
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F [Note 6]		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2

$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
	Bands FDD_A		-121		
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F [Note 6]		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	-87.76 +10log($N_{RB,c}$/50)	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-87.76 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_A		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_B1, FDD_B2		-87.26 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F [Note 6]		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	3
Time alignment error relative to cell 1 [Note 7]			-	≤TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.71.5-2: 6 DL RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			

	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io^{Note3}	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.71.5-3: 6 DL RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			

	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io^{Note3}	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.71.5-4: 6 DL RSRP carrier aggregation test parameters for cell 8 and cell 9

Parameter		Unit	Cell 8	Cell 9
E-UTRA RF Channel Number			5	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1	(RSRP for Cell 1

	Bands TDD_C		+8dB)	+4.8dB)
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.71.5-5: 6 DL RSRP carrier aggregation test parameters for cell 10 and cell 11

Parameter		Unit	Cell 10	Cell 11
E-UTRA RF Channel Number			6	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			

	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.71.5-6: RSRP Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 6)	Cell 6	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 6)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 8)	Cell 8	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 8)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 10)	Cell 10	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 10)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 6)	Cell 6	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 6)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 8)	Cell 8	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 8)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 10)	Cell 10	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 10)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.											

Table 9.1.71.5-7: RSRP Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + 2
Highest reported value (Cell 6)		RSRP_Cell 1 + 15
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + 2
Highest reported value (Cell 8)		RSRP_Cell 1 + 15
Lowest reported value (Cell 10)	Cell 1-10	RSRP_Cell 1 + 2
Highest reported value (Cell 10)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
1Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 - 1
Highest reported value (Cell 6)		RSRP_Cell 1 + 17
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 - 1
Highest reported value (Cell 8)		RSRP_Cell 1 + 17
Lowest reported value (Cell 10)	Cell 1-10	RSRP_Cell 1 - 1
Highest reported value (Cell 10)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 - 8
Highest reported value (Cell 7)		RSRP_Cell 6 + 1
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 - 8
Highest reported value (Cell 9)		RSRP_Cell 8 + 1
Lowest reported value (Cell 11)	Cell 10-11	RSRP_Cell 10 - 8
Highest reported value (Cell 11)		RSRP_Cell 10 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.72 7 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Applicability needs to be added to TS 36.521-2

9.1.72.1 Test purpose

To verify that RSRP absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.72.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 14 and forward that support 7DL CA.

This test case also applies to all types of E-UTRA TDD UE release 14 and forward that support 7DL CA.

This test case also applies to all types of E-UTRA UE release 14 and forward that support E-UTRA FDD, E-UTRA TDD and 7DL CA.

9.1.72.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.72.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.72.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.(TS 36.521-3 Section 3.5)

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2.

The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.72.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.72.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.72.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.72.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.72.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.72.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.72.

9.1.72.4 Test description

9.1.72.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-7 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.72.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure A.66a as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.72.4.3.

4. Cell 1 is PCell on the primary component carrier, and Cell 2, Cell 4, Cell 6, Cell 8, Cell 10 and Cell 12are activated SCells on secondary component carriers SCC1, SCC2, SCC3, SCC4, SCC5 and SCC6 respectively. Cell 3, Cell 5, Cell7, Cell 9, Cell 11 and Cell 13 are neighbouring cells on secondary component carriers SCC1, SCC2, SCC3, SCC4 SCC5 and SCC6 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell7, Cell8, Cell9, Cell10, Cell 11, Cell 12 and Cell 13 shall be powered OFF.

9.1.72.4.2 Test procedure

Test equipment shall select either baseline test method or alternative test method. Applied test method shall be identified in the test result.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4, Cell 6, Cell 8, Cell 10 and Cell 12) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.72.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.72.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

Baseline test method:

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4, Cell 6, Cell 8, Cell 10 and Cell 12 are compared to the actual RSRP values according to Table 9.1.72.5-6. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 8”, “Cell 10” and “Cell 12”. If the UE fails to report the measurement value for Cell 2 or Cell 4 or Cell 6 or Cell 8 or Cell 10, Cell 12 the number of failed iterations for the respective event is increased by one.

   The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell5, Cell 6, Cell 7, Cell 8, Cell 9, Cell 10, Cell 11, Cell 12 and Cell 13 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.72.5-7. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 1-10”, “Cell 1-12”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, “Cell 8-9”. “Cell 10-11” and “Cell 12-13”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell6, Cell 7, Cell 8, Cell 9, Cell 10, Cell 11, Cell 12 or Cell 13, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Alternative test method:

9. The neighbouring cell specified in Table 9.1.72.4.2-1 shall be powered ON and other neighbouring cells shall be powered OFF.

10. After 10s wait from Step 9, SS shall check the reported RSRP values in periodical MeasurementReport messages.

    The reported RSRP values for cells specified in Table 9.1.72.4.2-1 are compared to the actual RSRP values according to Table 9.1.72.5-6. This counts respectively as a Pass or Fail for the events specified in Table 9.1.72.4.2-1. If the UE fails to report the measurement value for cells in Table 9.1.72.4.2-1, the number of failed iterations for the respective event is increased by one.

11. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

12. Repeat Step 9 – 11 for each remaining rows of Table 9.1.72.4.2-1.

Table 9.1.72.4.2-1: Test configuration for the alternative test method

ID	Configured ServingCells	Configured NeighCell	Measured Cells	Measured Events
1	Cell 1, Cell 2, Cell 4, Cell 6, Cell 8, Cell 10, Cell 12	Cell 3	Cell 1, Cell 2, Cell 3	Cell 1, Cell 2, Cell 1-2, Cell 2-3
2		Cell 5	Cell 1, Cell 4, Cell 5	Cell 4, Cell 1-4, Cell 4-5
3		Cell 7	Cell 1, Cell 6, Cell 7	Cell 6, Cell 1-6, Cell 6-7
4		Cell 9	Cell 1, Cell 8, Cell 9	Cell 8, Cell 1-8, Cell 8-9
5		Cell 11	Cell 1, Cell 10, Cell 11	Cell 10, Cell 1-10, Cell 10-11
6		Cell 13	Cell 1, Cell 12, Cell 13	Cell 12, Cell 1-12, Cell 12-13

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 8”, “Cell 10”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 1-8”, “Cell 1-10”, “Cell 2-3”, “Cell 4-5”, “Cell 6-7”, “Cell 8-9”, “Cell 10-11” and “Cell 12-13” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.72.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.72.4.3-1: Common Exception messages for RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.72.5 Test requirement

Table 9.1.72.5-1, Table 9.1.72.5-2, Table 9.1.72.5-3, Table 9.1.72.5-4, Table 9.1.72.5-5 and Table 9.1.72.5-6 define the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.72.5-7.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.72.5-8.

Table 9.1.72.5-1: 7 DL RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
Duplex Mode			FDD or TDD	FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note1]					
OCNG_RB[Note1]					
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
	Bands FDD_A		-117		
	Bands FDD_B1, FDD_B2		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F [Note 6]		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		

$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96
RSRP Note3	Bands TDD_A	dBm/ 15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
	Bands FDD_A		-121		
	Bands FDD_B1, FDD_B2		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	-87.76 +10log($N_{RB,c}$/50)	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-87.76 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_A		-87.76 +10log($N_{RB,c}$/50)		
	Bands FDD_B1, FDD_B2		-87.26 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-2: 7 DL RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			

	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-3: 7 DL RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			

	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io^{Note3}	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-4: 7 DL RSRP carrier aggregation test parameters for cell 8 and cell 9

Parameter		Unit	Cell 8	Cell 9
E-UTRA RF Channel Number			5	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			

$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1[Note 7]			≤TAE	-
Time alignment error relative to cell 2[Note 7]			≤TAE	-
Time alignment error relative to cell 4[Note 7]			≤TAE	-
Time alignment error relative to cell 6[Note 7]			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-5: 7 DL RSRP carrier aggregation test parameters for cell 10 and cell 11

Parameter		Unit	Cell 10	Cell 11
E-UTRA RF Channel Number			6	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			

	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-6: 7 DL RSRP carrier aggregation test parameters for cell 12 and cell 13

Parameter		Unit	Cell 12	Cell 13
E-UTRA RF Channel Number			6	
Duplex Mode			FDD or TDD	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD For TDD: 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/ 15kHz	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 6]			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s / N_{oc}$		dB	3	-0.2
$\hat{E}_s / I_{ot}$		dB	0.09	-4.96
RSRP[Note3]	Bands TDD_A	dBm/ 15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C			
	Bands TDD_E			

	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A			
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 Note 7			≤TAE	-
Time alignment error relative to cell 2 Note 7			≤TAE	-
Time alignment error relative to cell 4 Note 7			≤TAE	-
Time alignment error relative to cell 6 Note 7			≤TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.72.5-7: RSRP Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E	Bands FDD_A	Bands FDD_B1, FDD_B2	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 6)	Cell 6	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 6)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 8)	Cell 8	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 8)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 10)	Cell 10	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 10)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 12)	Cell 12	RSRP_21	RSRP_22	RSRP_23	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 12)		RSRP_34	RSRP_35	RSRP_36	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions											
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 6)	Cell 6	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 6)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 8)	Cell 8	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 8)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 10)	Cell 10	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 10)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 12)	Cell 12	RSRP_17	RSRP_18	RSRP_19	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 12)		RSRP_38	RSRP_39	RSRP_40	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell											

6.

Table 9.1.72.5-8: RSRP Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + 2
Highest reported value (Cell 6)		RSRP_Cell 1 + 15
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + 2
Highest reported value (Cell 8)		RSRP_Cell 1 + 15
Lowest reported value (Cell 10)	Cell 1-10	RSRP_Cell 1 + 2
Highest reported value (Cell 10)		RSRP_Cell 1 + 15
Lowest reported value (Cell 12)	Cell 1-12	RSRP_Cell 1 + 2
Highest reported value (Cell 12)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
1Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 - 1
Highest reported value (Cell 6)		RSRP_Cell 1 + 17
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 - 1
Highest reported value (Cell 8)		RSRP_Cell 1 + 17
Lowest reported value (Cell 10)	Cell 1-10	RSRP_Cell 1 - 1
Highest reported value (Cell 10)		RSRP_Cell 1 + 17
Lowest reported value (Cell 12)	Cell 1-12	RSRP_Cell 1 - 1
Highest reported value (Cell 12)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 - 8
Highest reported value (Cell 7)		RSRP_Cell 6 + 1
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 - 8
Highest reported value (Cell 9)		RSRP_Cell 8 + 1
Lowest reported value (Cell 11)	Cell 10-11	RSRP_Cell 10 - 8
Highest reported value (Cell 11)		RSRP_Cell 10 + 1
Lowest reported value (Cell 13)	Cell 12-13	RSRP_Cell 10 - 8
Highest reported value (Cell 13)		RSRP_Cell 10 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2 RSRQ

9.2.1 FDD Intra frequency RSRQ Accuracy

9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy

9.2.1.1.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.2.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.1.1.3-1: RSRQ FDD intra frequency absolute accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.1.1.3-2.

Table 9.2.1.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1 and A.9.2.1.

9.2.1.1.4 Test description

9.2.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.1.1.4.3.

4. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.1.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.1.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.1.1.5-2 as appropriate.

9.2.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.1.1.4.3-1: Common Exception messages for RSRQ FDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.1.1.4.3-2: *MeasResults*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.1.1.5 Test requirement

Table 9.2.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.1.1.5-3.

Table 9.2.1.1.5-1: Void

Table 9.2.1.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-85.51		-103.85		-116	
	FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 5]						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	FDD_B1, FDD_B2						-119.10	-119.10
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F [Note 5]						-117.60	-117.60
	Bands FDD_G						-116.60	-116.60
	Bands FDD_H						-116.10	-116.10
RSRQ[Note3]	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							

Io[Note3]	Bands FDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	FDD_B1, FDD_B2						-84.99	
	Bands FDD_C						-84.49	
	Bands FDD_D						-83.99	
	Bands FDD_E, FDD_F [Note 5]						-83.49	
	Bands FDD_G						-82.49	
	Bands FDD_H						-81.99	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.1.1.5-3: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.1.1_2 FDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis

9.2.1.1_2.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.1.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.2.1.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.1.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.1.1_2.3-1: RSRQ FDD Intra frequency absolute accuracy for UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
[±3.5]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±4.5]	[±5]	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.1.1_2.3-2.

Table 9.2.1.1_2.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.5 and A.9.2.1.

9.2.1.1_2.4 Test description

9.2.1.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.1.1_2.4.3.
4. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.1.1_2.4.2 Test procedure

Same as 9.2.1.1.4.2.

9.2.1.1_2.4.3 Message contents

Same as 9.2.1.1.4.3.

9.2.1.1_2.5 Test requirement

Table 9.2.1.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.1.1_2.5-3.

Table 9.2.1.1_2.5-1: Void

Table 9.2.1.1_2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 5]						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F [Note 5]						-117.60	-117.60
	Bands FDD_G						-116.60	-116.60
	Bands FDD_H						-116.10	-116.10
RSRQ[Note3]	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							

	Bands FDD_H							
Io[Note3]	Bands FDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	Bands FDD_C						-84.49	
	Bands FDD_D						-83.99	
	Bands FDD_E, FDD_F [Note 5]						-83.49	
	Bands FDD_G						-82.49	
	Bands FDD_H						-81.99	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.1.1_2.5-3: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.2 TDD Intra frequency RSRQ Accuracy

9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy

9.2.2.1.1 Test purpose

To verify that the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all TDD bands.

9.2.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.2.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.2.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.2.1.3-1: RSRQ TDD intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.2.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.2.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.2.2.

9.2.2.1.4 Test description

9.2.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.2.1.4.3.

4. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.2.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ according to Table 9.2.2.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.2.1.5-2 as appropriate.

9.2.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.2.1.4.3-1: Common Exception messages for RSRQ TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.2.1.4.3-2: *MeasResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResuCellItsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
measResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.2.1.5 Test requirement

Table 9.2.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.2.1.5-3.

Table 9.2.2.1.5-1: Void

Table 9.2.2.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink-downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-85.51		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands TDD_C						-118.60	-118.60
	Bands TDD_E						-117.60	-117.60
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io[Note4]	Bands TDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	Bands TDD_C						-84.49	
	Bands TDD_E						-83.49	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.2.1.5-3: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.2.1_2 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis

9.2.2.1_2.1 Test purpose

To verify that the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all TDD bands.

9.2.2.1_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bit 16.

9.2.2.1_2.3 Minimum conformance requirements

Same as 9.2.1.1_1.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.5 and A.9.2.2.

9.2.2.1_2.4 Test description

9.2.2.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.2.1_2.4.3.
4. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.2.1_2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.2.1_.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ according to Table 9.2.2.1_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.2.1_2.5-2 as appropriate.

9.2.2.1_2.4.3 Message contents

Same as 9.2.2.1.4.3.

9.2.2.1_2.5 Test requirement

Table 9.2.2.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.2.1_2.5-3.

Table 9.2.2.1_2.5-1: Void

Table 9.2.2.1_2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink-downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands TDD_C						-118.60	-118.60
	Bands TDD_E						-117.60	-117.60
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io[Note4]	Bands TDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	Bands TDD_C						-84.49	
	Bands TDD_E						-83.49	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.2.1_2.5-3: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3 FDD - FDD Inter frequency RSRQ Accuracy

9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy

9.2.3.1.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.3.1.3-1: RSRQ FDD - FDD inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.1.3-2.

Table 9.2.3.1.3-2: RSRQ FDD - FDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.3.

9.2.3.1.4 Test description

9.2.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.3.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.3.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.3.1.5-2 as appropriate.

9.2.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.1.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.1.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.1.5 Test requirement

Table 9.2.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.3.1.5-3.

Table 9.2.3.1.5-1: Void

Table 9.2.3.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-80.0	-81.1	-104.7	-104.7	-119.5	-119.2
	FDD_B1, FDD_B2						-119	-118.7
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F [Note 5]						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.5	-122.4
	FDD_B1, FDD_B2						-123	-121.9
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F [Note 5]						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
Io[Note3]	Bands FDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	FDD_B1, FDD_B2						-89.75	-89.22

	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F Note 5						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.3.1.5-3: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3.1_2 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis

9.2.3.1_2.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.3.1_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.3.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.3.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.3.1_2.3-1: RSRQ FDD-FDD Inter frequency absolute accuracy for UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
[±3.5]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±4.5]	[±5]	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.1_2.3-2.

Table 9.2.3.1_2.3-2: RSRQ FDD - FDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.5 and A.9.2.3.

9.2.3.1_2.4 Test description

9.2.3.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.3.1_2.4.3.
4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.1_2.4.2 Test procedure

Same as 9.2.3.1.4.2.

9.2.3.1_2.4.3 Message contents

Same as 9.2.3.1.4.3.

9.2.3.1_2.5 Test requirement

Table 9.2.3.1_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.3.1_2.5-3.

Table 9.2.3.1_2.5-1: Void

Table 9.2.3.1_2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-80.0	-81.1	-104.7	-104.7	-119.5	-119.2
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F [Note 5]						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.5	-122.4
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F [Note 5]						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
Io[Note3]	Bands FDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F [Note 5]						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2

Propagation condition	-	AWGN	AWGN	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.				
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.				
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.				
Note 6: E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.				

Table 9.2.3.1_2.5-3: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_18	RSRQ_18
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ

9.2.3.2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.3.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.3.2.3-1: RSRQ FDD - FDD inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.2.3-2.

Table 9.2.3.2.3-2: RSRQ FDD - FDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.3.

9.2.3.2.4 Test description

9.2.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.3.2.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.3.2.5-2 as appropriate.

9.2.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.2.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.2.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.2.5 Test requirement

Table 9.2.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.3.2.5-3.

Table 9.2.3.2.5-1: Void

Table 9.2.3.2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-81.1	-81.1	-104.7	-104.7	-119.5	-119.2
	FDD_B1, FDD_B2						-119	-118.7
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F [Note 5]						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.5	-122.4
	FDD_B1, FDD_B2						-122	-121.9
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F [Note 5]						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
Io[Note3]	Bands FDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	FDD_B1, FDD_B2						-89.76	-89.22

	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F Note 5						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.3.2.5-3: RSRQ FDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x +8	RSRQ_x +11	RSRQ_x +11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis

9.2.3.2_2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.3.2_2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.3.2_2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.3.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left|RSRP1|_{dBm} - RSRP2|_{dBm}\right| \leq [27]dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.3.2_2.3-1: RSRQ FDD-FDD Inter frequency relative accuracy for UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
[±4]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±5]	[±5]	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.2_2.3-2.

Table 9.2.3.2_2.3-2: RSRQ FDD - FDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.6 and A.9.2.3.

9.2.3.2_2.4 Test description

9.2.3.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.3.2_2.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.2_2.4.2 Test procedure

Same as 9.2.3.2.4.2.

9.2.3.2_2.4.3 Message contents

Same as 9.2.3.2.4.3.

9.2.3.2_2.5 Test requirement

Table 9.2.3.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.3.2_2.5-3.

Table 9.2.3.2_2.5-1: Void

Table 9.2.3.2_2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-81.1	-81.1	-104.7	-104.7	-119.5	-119.2
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F [Note 5]						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.5	-122.4
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F [Note 5]						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
Io[Note3]	Bands FDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F [Note 5]						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2

Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.3.2_2.5-3: RSRQ FDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 11	RSRQ_x - 11
Highest reported value (Cell 2)	RSRQ_x +10	RSRQ_x +13	RSRQ_x +13
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x – 12	RSRQ_x - 11	RSRQ_x - 11
Highest reported value (Cell 2)	RSRQ_x + 12	RSRQ_x +13	RSRQ_x +13
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4 TDD - TDD Inter frequency RSRQ Accuracy

9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy

9.2.4.1.1 Test purpose

To verify that the TDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.2.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or RSRQ value of Cell 2 reported by the UE four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4.1.3-1: RSRQ TDD - TDD inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.4.

9.2.4.1.4 Test description

9.2.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4.1.4.3.

4. There are two E-UTRA TDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.1.5-2 as appropriate.

9.2.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.1.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.1.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell	SEQUENCE {		
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.1.5 Test requirement

Table 9.2.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4.1.5-3.

Table 9.2.4.1.5-1: Void

Table 9.2.4.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-80.0	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.4.1.5-3: RSRQ TDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.1_1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy (Rel-12 and forward)

9.2.4.1_1.1 Test purpose

Same test purpose as in clause 9.2.4.1.1.

9.2.4.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.4.1.3.

9.2.4.1_1.4 Test description

9.2.4.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.2.4.1.4.1 with the following exceptions:

- Instead of 9.2.4.1.4.3 → use 9.2.4.1_1.4.3.

9.2.4.1_1.4.2 Test procedure

The test shall be performed twice for TDD UL/DL configuration 1 and configuration 0 respectively.

Test procedures for TDD UL/DL configuration 1:

Same test procedure as in clause 9.2.4.1.4.2 with the following exceptions:

- Instead of Table 9.2.4.1.5-2 → use Table 9.2.4.1_1.5-1.
- Instead of Table 9.2.4.1.5-3 → use Table 9.2.4.1_1.5-3.

Test procedures for TDD UL/DL configuration 0:

Same test procedure as in clause 9.2.4.1.4.2 with the following exceptions:

- Instead of Table 9.2.4.1.5-2 → use Table 9.2.4.1_1.5-2.
- Instead of Table 9.2.4.1.5-3 → use Table 9.2.4.1_1.5-3.

9.2.4.1_1.4.3 Message contents

Same message contents as in clause 9.2.4.1.4.3 with following exceptions:

Table 9.2.4.1_1.4.3-1: *SystemInformationBlockType1* for TDD UL/DL configuration 0

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	ssp6		
}			
}			

9.2.4.1_1.5 Test requirement

Table 9.2.4.1_1.5-1 and Table 9.2.4.1_1.5-2 define the primary level settings including test tolerances for all tests for TDD UL/DL configuration 1 and 0 respectively.

Each RSRQ TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4.1_1.5-3.

Table 9.2.4.1_1.5-1: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy for TDD configuration 1

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-80.0	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.4.1_1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy for TDD configuration 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			0		0		0	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.5 TDD	-	R.5 TDD	-	R.5 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-80.0	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.4.1_1.5-3: RSRQ TDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.1_2 TDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis

9.2.4.1_2.1 Test purpose

To verify that the TDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4.1_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.4.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or RSRQ value of Cell 2 reported by the UE four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4.1_2.3-1: RSRQ TDD-TDD Inter frequency absolute accuracy for UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
[±3.5]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±4.5]	[±5]	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4.1_2.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.5 and A.9.2.4.

9.2.4.1_2.4 Test description

9.2.4.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.4.1_2.4.3.
4. There are two E-UTRA TDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.1_2.4.2 Test procedure

Same as 9.2.4.1.4.2.

9.2.4.1_2.4.3 Message contents

Same as 9.2.4.1.4.3.

9.2.4.1_2.5 Test requirement

Table 9.2.4.1_2.5-2 defines the primary level settings including test tolerances for all tests. Each RSRQ TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4.1_2.5-3.

Table 9.2.4.1_2.5-1: Void

Table 9.2.4.1_2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-80.0	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.4.1_2.5-3: RSRQ TDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_18	RSRQ_18
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ

9.2.4.2.1 Test purpose

To verify that the TDD - TDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.2.4.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4.2.3-1: RSRQ TDD - TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.4.

9.2.4.2.4 Test description

9.2.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4.2.4.3.

4. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.4.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.2.5-2 as appropriate.

9.2.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.2.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.2.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.2.5 Test requirement

Table 9.2.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4.2.5-3.

Table 9.2.4.2.5-1: Void

Table 9.2.4.2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-81.1	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.4.2.5-3: RSRQ TDD - TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x -9	RSRQ_x -9
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 11	RSRQ_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.2_1 TDD - TDD Inter Frequency Relative Accuracy of RSRQ (Rel-12 and forward)

9.2.4.2_1.1 Test purpose

Same test purpose as in clause 9.2.4.2.1.

9.2.4.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.4.2.3.

9.2.4.2_1.4 Test description

9.2.4.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.2.4.2.4.1 with the following exceptions:

- Instead of 9.2.4.2.4.3 → use 9.2.4.2_1.4.3.

9.2.4.2_1.4.2 Test procedure

The test shall be performed twice for TDD UL/DL configuration 1 and configuration 0 respectively.

Test procedures for TDD UL/DL configuration 1:

Same test procedure as in clause 9.2.4.2.4.2 with the following exceptions:

- Instead of Table 9.2.4.2.5-2 → use Table 9.2.4.2_1.5-1.

- Instead of Table 9.2.4.2.5-3 → use Table 9.2.4.2_1.5-3.

Test procedures for TDD UL/DL configuration 0:

Same test procedure as in clause 9.2.4.1.4.2 with the following exceptions:

- Instead of Table 9.2.4.2.5-2 → use Table 9.2.4.2_1.5-2.
- Instead of Table 9.2.4.2.5-3 → use Table 9.2.4.2_1.5-3.

9.2.4.2_1.4.3 Message contents

Same message contents as in clause 9.2.4.2.4.3 with following exceptions:

Table 9.2.4.2_1.4.3-1: *SystemInformationBlockType1* for TDD UL/DL configuration 0

Derivation Path: 36.508 Table 4.4.3.2-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
tdd-Config SEQUENCE ::= SEQUENCE {			
subframeAssignment	sa0		
specialSubframePatterns	ssp6		
}			
}			

9.2.4.2_1.5 Test requirement

Table 9.2.4.2_1.5-1 and Table 9.2.4.2_1.5-2 define the primary level settings including test tolerances for all tests for TDD UL/DL configuration 1 and 0 respectively.

Each RSRQ TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4.2_1.5-3.

Table 9.2.4.2_1.5-1: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy for TDD configuration 1

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-81.1	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.4.2_1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy for TDD configuration 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			0		0		0	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.5 TDD	-	R.5 TDD	-	R.5 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-81.1	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.4.2_1.5-3: RSRQ TDD - TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x -9	RSRQ_x -9
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 11	RSRQ_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis

9.2.4.2_1.1 Test purpose

To verify that the TDD - TDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4.2_2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.4.2_2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4.2_2.3-1: RSRQ TDD-TDD Inter frequency relative accuracy for UE category 1bis

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
[±4]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±5]	[±5]	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4.2_2.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.6 and A.9.2.4.

9.2.4.2_2.4 Test description

9.2.4.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.4.2_2.4.3.
4. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.2_2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.4.2_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.4.2_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.2_2.5-2 as appropriate.

9.2.4.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.2_2.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.2_2.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.2_2.5 Test requirement

Table 9.2.4.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4.2_2.5-3.

Table 9.2.4.2_2.5-1: Void

Table 9.2.4.2_2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-81.1	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.4.2_2.5-3: RSRQ TDD - TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x -11	RSRQ_x -11
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 13	RSRQ_x + 13
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 12	RSRQ_x - 11	RSRQ_x - 11
Highest reported value (Cell 2)	RSRQ_x + 12	RSRQ_x + 13	RSRQ_x + 13
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A FDD - TDD Inter frequency RSRQ Accuracy

9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy

9.2.4A.1.1 Test purpose

To verify that the FDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4A.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4A.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4A.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4A.1.3-1: RSRQ FDD - TDD inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.1.3-2.

Table 9.2.4A.1.3-2: RSRQ FDD - TDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.4A.

9.2.4A.1.4 Test description

9.2.4A.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4A.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, the SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4A.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 as appropriate.

9.2.4A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.1.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.1.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.1.5 Test requirement

Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4A.1.5-3.

Table 9.2.4A.1.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-80	-104.70	-114.5
$\hat{E}_s / I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-81.75	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-50	-75.46	-85.26
$\hat{E}_s / N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (TDD Cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s / I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.9	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s / N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1.5-3: RSRQ FDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A.1_2 FDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE category 1bis

9.2.4A.1_2.1 Test purpose

To verify that the FDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4A.1_2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.4A.1_2.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4A.1_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4A.1_2.3-1: RSRQ FDD - TDD inter frequency absolute accuracy for UE category 1bis

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
[±3.5]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±4.5]	[±5]	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.1_2.3-2.

Table 9.2.4A.1_2.3-2: RSRQ FDD - TDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.5 and A.9.2.4A.

9.2.4A.1_2.4 Test description

9.2.4A.1_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.4A.1_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.1_2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.4A.1_2.5-1 and 9.2.4A.1_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, the SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4A.1_2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.4A.1_2.5-1 and 9.2.4A.1_2.5-2 as appropriate.

9.2.4A.1_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.1_2.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.1_2.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.1_2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.1_2.5 Test requirement

Table 9.2.4A.1_2.5-1 and 9.2.4A.1_2.5-2 define the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4A.1_2.5-3.

Table 9.2.4A.1_2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-80	-104.70	-114.5
$\hat{E}_s / I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-81.75	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-50	-75.46	-85.26
$\hat{E}_s / N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1_2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (TDD Cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2	dB	0	0	0
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s / I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.9	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s / N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1_2.5-3: RSRQ FDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_18	RSRQ_18
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ

9.2.4A.2.1 Test purpose

To verify that the FDD - TDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4A.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4A.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4A.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4A.2.3-1: RSRQ FDD - TDD inter frequency relative accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot [Note 2]	E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.2.3-2.

Table 9.2.4A.2.3-2: RSRQ FDD - TDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.4A.

9.2.4A.2.4 Test description

9.2.4A.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4A.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, the SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 as appropriate.

9.2.4A.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.2.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.2.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.2.5 Test requirement

Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4A.2.5-3.

Table 9.2.4A.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-81.10	-104.70	-114.5
$\hat{E}_s / I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-82.85	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-51.10	-75.46	-85.26
$\hat{E}_s / N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (TDD cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s / I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.90	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s / N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2.5-3: RSRQ FDD-TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x-8	RSRQ_x-10	RSRQ_x-10
Highest reported value (Cell 2)	RSRQ_x+8	RSRQ_x+10	RSRQ_x+10
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x-10	RSRQ_x-10	RSRQ_x-10
Highest reported value (Cell 2)	RSRQ_x+10	RSRQ_x+10	RSRQ_x+10
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE category 1bis

9.2.4A.2_2.1 Test purpose

To verify that the FDD - TDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4A.2_2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD UE release 13 and forward of UE category 1bis. Applicability requires support for FGI bits 16 and 25.

9.2.4A.2_2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4A.2_2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left|RSRP1|_{dBm} - RSRP2|_{dBm}\right| \leq [27]dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4A.2_2.3-1: RSRQ FDD - TDD inter frequency relative accuracy for UE category 1bis

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot [Note 2]	E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/BW$_{Channel}$
[±4]	[±5]	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
[±5]	[±5]	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.2.3-2.

Table 9.2.4A.2_2.3-2: RSRQ FDD - TDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.6 and A.9.2.4A.

9.2.4A.2_2.4 Test description

9.2.4A.2_2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.4A.2_2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.2_2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.4A.2_2.5-1 and 9.2.4A.2_2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, the SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.4A.2_2.5-1 and 9.2.4A.2_2.5-2 as appropriate.

9.2.4A.2_2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.2_2.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.2_2.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.2_2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.2_2.5 Test requirement

Table 9.2.4A.2_2.5-1 and 9.2.4A.2_2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4A.2_2.5-3.

Table 9.2.4A.2_2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-81.10	-104.70	-114.5
$\hat{E}_s / I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-82.85	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-51.10	-75.46	-85.26
$\hat{E}_s / N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2_2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (TDD cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s / I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.90	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s / N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2_2.5-3: RSRQ FDD-TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x-10	RSRQ_x-12	RSRQ_x-12
Highest reported value (Cell 2)	RSRQ_x+10	RSRQ_x+12	RSRQ_x+12
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x-12	RSRQ_x-12	RSRQ_x-12
Highest reported value (Cell 2)	RSRQ_x+12	RSRQ_x+12	RSRQ_x+12
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.5 FDD RSRQ for E-UTRA Carrier Aggregation

9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.5.1.1 Test purpose

To verify that FDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.5.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.5.1.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The FDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.5.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.5.1.3-1: FDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.5.1.3-2.

Table 9.2.5.1.3-2: FDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.5.

9.2.5.1.4 Test description

9.2.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.5.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.5.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.5.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.5.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.5.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.5.1.5 Test requirement

Table 9.2.5.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.1.5-2.

Table 9.2.5.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
Time offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-116	
	Bands: FDD_B1 FDD_B2		-119	-115.5	
	Bands FDD_C		-118.5	-115	
	Bands FDD_D		-118	-114.5	
	Bands FDD_E, FDD_F Note 6		-117.5	-114	
	Bands FDD_G		-116.5	-113	
	Bands FDD_H		-116	-112.5	
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP Note3	Bands FDD_A	dBm/15 kHz	-123.5	-119.7	-120
	Bands: FDD_B1 FDD_B2		-123	-119.2	-119.5
	Bands FDD_C		-122.5	-118.7	-119
	Bands FDD_D		-122	-118.2	-118.5

	Bands FDD_E, FDD_F Note 6		-121.5	-117.7	-118
	Bands FDD_G		-120.5	-116.7	-117
	Bands FDD_H		-120	-116.2	-116.5
RSRQ[Note3]	Bands FDD_A	dB	-16.25	-17.10	-17.40
	Bands FDD_C				
	Bands: FDD_B1 FDD_B2				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io[Note3]	Bands FDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands: FDD_B1 FDD_B2		-89.76	-85.11	
	Bands FDD_C		-89.26	-84.61	
	Bands FDD_D		-88.76	-84.11	
	Bands FDD_E, FDD_F Note 6		-88.26	-83.67	
	Bands FDD_G		-87.26	-82.61	
	Bands FDD_H		-86.76	-82.11	
$\hat{E}_s / N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

NOTE 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs

NOTE 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz

NOTE 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.5.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.5.2 FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation

9.2.5.2.1 Test purpose

To verify that FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.5.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.5.2.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.5.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.5.2.3-1: FDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.5.2.3-2.

Table 9.2.5.2.3-2: FDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.5.

9.2.5.2.4 Test description

9.2.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.5.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.5.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.5.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.5.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.5.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.5.2.5 Test requirement

Table 9.2.5.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.5.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
Time offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-116	
	Bands: FDD_B1 FDD_B2		-119	-115.5	
	Bands FDD_C		-118.5	-115	
	Bands FDD_D		-118	-114.5	
	Bands FDD_E, FDD_F Note 6		-117.5	-114	
	Bands FDD_G		-116.5	-113	
	Bands FDD_H		-116	-112.5	
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP Note3	Bands FDD_A	dBm/15 kHz	-123.5	-119.7	-120
	Bands: FDD_B1 FDD_B2		-123	-119.2	-119.5
	Bands FDD_C		-122.5	-118.7	-119
	Bands FDD_D		-122	-118.2	-118.5

	Bands FDD_E, FDD_F Note 6		-121.5	-117.7	-118
	Bands FDD_G		-120.5	-116.7	-117
	Bands FDD_H		-120	-116.2	-116.5
RSRQ[Note3]	Bands FDD_A	dB	-16.25	-17.10	-17.40
	Bands: FDD_B1 FDD_B2				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io[Note3]	Bands FDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands: FDD_B1 FDD_B2		-89.76	-85.11	
	Bands FDD_C		-89.26	-84.61	
	Bands FDD_D		-88.76	-84.11	
	Bands FDD_E, FDD_F Note 6		-88.26	-83.61	
	Bands FDD_G		-87.26	-82.61	
	Bands FDD_H		-86.76	-82.11	
$\hat{E}_s / N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

NOTE 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs

NOTE 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz

NOTE 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.5.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.6 TDD RSRQ for E-UTRA Carrier Aggregation

9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.6.1.1 Test purpose

To verify that TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.6.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.6.1.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.6.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.6.1.3-1: TDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.6.1.3-2.

Table 9.2.6.1.3-2: TDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.6.

9.2.6.1.4 Test description

9.2.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.6.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.6.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2) [and (Cell 3)].

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.6.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.6.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.6.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.6.1.5 Test requirement

Table 9.2.6.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.6.1.5-2.

Table 9.2.6.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.50	-119.7	-120
	Bands TDD_C		-122.50	-118.7	-119
	Bands TDD_E		-121.50	-117.7	-118
RSRQ[Note4]	Bands TDD_A	dB	-16.25	-17.10	-17.40
Io[Note4]	Bands TDD_C	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_E		-89.26	-84.61	
	Bands TDD_A		-88.26	-83.61	
$\hat{E}_s / N_{oc}$		dB	-4.0	-3.70	-4.0
Propagation condition		-	AWGN		

NOTE 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.6.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.6.2.1 Test purpose

To verify that TDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.6.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.6.2.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.6.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|$_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq [27]dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.6.2.3-1: TDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.6.2.3-2.

Table 9.2.6.2.3-2: TDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.6.

9.2.6.2.4 Test description

9.2.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.6.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.6.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.6.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.6.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.6.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.6.2.5 Test requirement

Table 9.2.6.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.6.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.50	-119.7	-120
	Bands TDD_C		-122.50	-118.7	-119
	Bands TDD_E		-121.5	-117.7	-118
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-16.25	-17.10	-17.40
Io[Note4]	Bands TDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_C		-89.26	-84.61	
	Bands TDD_E		-88.26	-83.61	
$\hat{E}_s / N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.6.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.7 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.2.7.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits for all bands.

9.2.7.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.2.7.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.7.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.7.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 4	$dBm/BW_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.7.1.3-2.

Table 9.2.7.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.7.

9.2.7.1.4 Test description

9.2.7.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.7.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.7.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.7.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells 3µs or 92*Ts
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met.
ABS pattern		'10000000100000001000000010000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'10000000100000001000000010000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'01000000010000000100000001000000001000000'	Configured for measurements on Cell 1.

9.2.7.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table 9.2.7.1.4.1-1 and Table 9.2.7.1.5-1 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.7.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.7.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.7.1.5-1 as appropriate.

9.2.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.7.1.4.3-1: Common Exception messages for RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4 Table H.3.5-5

Table 9.2.7.1.4.3-2: *MeasResults*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.7.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.7.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.2.7.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.2.7.1.5 Test requirement

Table 9.2.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.7.1.5-2.

Table 9.2.7.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands: FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 7]						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	2.55	-1.20	2.55	-1.20	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP[Note3,4,5]	Bands FDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands: FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F [Note 7]						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands FDD_A, FDD_B1, FDD_B2, FDD_C, FDD_E, FDD_F [Note 7], FDD_G, FDD_H	dB	-12.71	-14.80	-12.71	-14.80	-12.47	-16.01
$(\mathrm{Io})_{meas}$ [Note3]	Bands FDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.54	-85.16
	Bands: FDD_B1, FDD_B2						-81.04	-84.66

	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Applies to all subframes.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.7.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.8 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.2.8.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits for all bands.

9.2.8.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.2.8.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.8.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.8.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 4	dBm/BW$_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.8.1.3-2.

Table 9.2.8.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.8.

9.2.8.1.4 Test description

9.2.8.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.8.1.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.8.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells 3µs or 92*Ts
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 !=0$	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.2.8.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table 9.2.8.1.4.1-1 and Table 9.2.8.1.5-1 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.8.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.8.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.8.1.5-1 as appropriate.

9.2.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.8.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.8.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.8.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.8.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.2.8.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.2.8.1.5 Test requirement

Table 9.2.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.8.1.5-2.

Table 9.2.8.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	2.55	-1.20	2.55	-1.20	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP[Note3,4,5]	Bands TDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-12.71	-14.80	-12.71	-14.80	-12.47	-16.01
$(\mathrm{Io})_{meas}$ [Note3]	Bands TDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Table 9.2.8.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.9 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS

9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.2.9.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with MBSFN ABS is within the specified limits for all bands.

9.2.9.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support of FGI bit 115.

9.2.9.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.9.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.9.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with MBSFN ABS

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 4	dBm/BW$_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.9.1.3-2.

Table 9.2.9.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.9.

9.2.9.1.4 Test description

9.2.9.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.9.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.2.9.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
PDSCH parameters Note 1		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters Note 1		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Serving cell (PCell)		Cell 1	Also the aggressor cell on E-UTRA RF channel number 1
Neighbour cell		Cell 2	Cell to be identified on E-UTRA RF channel number 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For all cells in the test
PCell ABS configuration		MBSFN ABS	As defined in Table C.3.1.2.1-1
CP length		Normal	
DRX		OFF	
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2}) mod 6 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that the condition is met (colliding CRS)
Cell 1 MBSFN ABS pattern		'01000000100000001000 00000010000001000000'	ABS subframe is only MBSFN subframe. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. Configured in Cell 1.
Time domain measurement resource restriction pattern for PCell (Cell 1) measurements on RF Channel 1		'00010000000100000001 00000001000000010000'	Time domain measurement resource restriction pattern for PCell measurement signalled to the UE in measSubframePatternPCell. The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [5], clause 6.3.6. Configured for Cell 1 measurements.
Time domain measurement resource restriction pattern for neighbour cell (Cell 2) measurements on RF Channel 1		'01000000100000001000 00000010000001000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [5], clause 6.3.6. Configured for Cell 2 measurements.
Note 1: Applies to restricted measurement subframes of the respective cell.			

9.2.9.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.2.9.1.5-1 and 9.2.9.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.9.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.9.1.5-1 as appropriate.

9.2.9.1.4.3 Message contents

Table 9.2.9.1.4.3-1: Common Exception messages for RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4 Table H.3.5-5

Table 9.2.9.1.4.3-2: *MeasResults*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.9.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.9.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'00010000000100000001 00000001000000010000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.2.9.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.2.9.1.4.3-6: *SystemInformationBlockType2*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.2.9.1.4.3-7: *SystemInformationBlockType3*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.2.9.1.5 Test requirement

Table 9.2.9.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.9.1.5-2.

Table 9.2.9.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) Note5			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands: FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $(\hat{E}_s / I_{ot})_{meas}$ Note5, Note 7 in the 1st OFDM symbol		dB	2.55	-7.39	2.55	-7.39	3.25	-9.39
CRS $(\hat{E}_s / Iot)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	2.55	-1.2	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands: FDD_B1, FDD_B2						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
(RSRQ) *meas* Note3,4,5	Bands FDD_A	dB	-12.71	-14.54	-12.71	-14.54	-12.47	-15.70
	Bands: FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 8							
	Bands FDD_G							
	Bands FDD_H							
(Io) *meas* Note3 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.55	-85.20
	Bands: FDD_B1, FDD_B2						-81.05	-84.70

	Bands FDD_C						-80.55	-84.20
	Bands FDD_D						-80.05	-83.70
	Bands FDD_E, FDD_F Note 8						-79.55	-83.20
	Bands FDD_G						-78.55	-82.20
	Bands FDD_H						-78.05	-81.70
(Io) *meas* Note3 OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-51.06	-55.53	-69.15	-73.62	-81.54	-86.47
	Bands: FDD_B1, FDD_B2						-81.04	-85.97
	Bands FDD_C						-80.54	-85.47
	Bands FDD_D						-80.04	-84.97
	Bands FDD_E, FDD_F Note 8						-79.54	-84.47
	Bands FDD_G						-78.54	-83.47
	Bands FDD_H						-78.04	-82.97
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Applies to all subframes.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.

Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] 9.1.5.2.

Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.9.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.10 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS

9.2.10.1 TDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.2.10.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with MBSFN ABS is within the specified limits for all bands.

9.2.10.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support of FGI bit 115

9.2.10.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.10.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.10.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with MBSFN ABS

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 4	dBm/BW$_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.10.1.3-2.

Table 9.2.10.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.10.

9.2.10.1.4 Test description

9.2.10.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.10.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.2.10.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
PCell ABS configuration		MBSFN ABS	As defined in Table C.3.1.2.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 =0$ PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

9.2.10.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.9.1.5-1 and 9.2.9.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ values according to Table 9.2.10.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.2.10.1.4.3 Message contents

Table 9.2.10.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.10.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.10.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.10.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.2.10.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.2.10.1.4.3-6: *SystemInformationBlockType2*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.2.10.1.4.3-7: *SystemInformationBlockType3*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.2.10.1.5 Test requirement

Table 9.2.10.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.10.1.5-2.

Table 9.2.10.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD)			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $(\hat{E}_s / Iot)_{meas}$ [Note 5] In the 1st OFDM symbol		dB	2.55	-7.39	2.55	-7.39	3.25	-9.39
CRS $(\hat{E}_s / Iot)_{meas}$ [note 5] in OFDM symbols 4,7,11		dB	2.55	-1.2	2.55	-1.2	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP[Note 3,4,5]	Bands TDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-12.71	-14.54	-12.71	-14.54	-12.47	-15.70
$(\mathrm{Io})_{meas}$ [Note3] in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.55	-85.20
	Bands TDD_C						-80.55	-84.20
	Bands TDD_E						-79.55	-83.20
$(\mathrm{Io})_{meas}$ [Note3] in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-51.06	-55.53	-69.15	-73.62	-81.54	-86.47
	Bands TDD_C						-80.54	-85.47
	Bands TDD_E						-79.54	-84.47
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7:	In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] 9.1.5.2.

Table 9.2.10.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%

9.2.11 FDD RSRQ for E-UTRA Carrier Aggregation for 20MHz

9.2.11.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.11.1.1 Test purpose

To verify that FDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions for 20MHz. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.11.1.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.11.1.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The FDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.11.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.11.1.3-1: FDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.11.1.3-2.

Table 9.2.11.1.3-2: FDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.11.

9.2.11.1.4 Test description

9.2.11.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.11.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.11.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.11.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.11.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.11.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.11.1.5 Test requirement

Table 9.2.11.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.11.1.5-2.

Table 9.2.11.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD	R.10 FDD	R.10 FDD
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io^{Note2}	Bands FDD_A Note 5	dBm/18 MHz	-87.26	-82.67	
	Bands: FDD_B1, FDD_B2 Note 5		-86.76	-82.17	
	Bands FDD_C Note 5		-86.26	-81.67	
	Bands FDD_D Note 5		-85.76	-81.17	
	Bands FDD_E Note 5		-85.26	-80.67	
	Bands FDD_G Note 5		-84.26	-79.67	
	Bands FDD_H Note 5		-83.76	-79.17	

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.2.5.2.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.2.11.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.11.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.11.2.1 Test purpose

To verify that FDD relative RSRQ measurement accuracy in carrier aggregation for 20MHz is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.11.2.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.11.2.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.11.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.11.2.3-1: FDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io

dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.11.2.3-2.

Table 9.2.11.2.3-2: FDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.11.

9.2.11.2.4 Test description

9.2.11.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.11.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component

Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.11.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.11.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.11.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.11.2.4.3 Message contents

Table 9.2.11.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.11.2.5 Test requirement

Table 9.2.11.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.11.2.5-2.

Table 9.2.11.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation

Parameters	Test 1			
	Units	Cell 1	Cell 2	Cell 3

$BW_{channel\_CA}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD	R.10 FDD	R.10 FDD
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-87.26	-82.67	
	Bands: FDD_B1, FDD_B2 Note 5		-86.76	-82.17	
	Bands FDD_C Note 5		-86.26	-81.67	
	Bands FDD_D Note 5		-85.76	-81.17	
	Bands FDD_E Note 5		-85.26	-80.67	
	Bands FDD_G Note 5		-84.26	-79.67	
	Bands FDD_H Note 5		-83.76	-79.17	

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.2.5.2.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.2.12.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.12 TDD RSRQ for E-UTRA Carrier Aggregation for 20MHz

9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.12.1.1 Test purpose

To verify that TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions for 20MHz. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.12.1.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.12.1.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.12.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.12.1.3-1: TDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.12.1.3-2.

Table 9.2.12.1.3-2: TDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.12.

9.2.12.1.4 Test description

9.2.12.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.12.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.12.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.12.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, The SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.12.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.12.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.12.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.12.1.5 Test requirement

Table 9.2.12.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.12.1.5-2.

Table 9.2.12.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-87.26	-82.60	
	Bands TDD_C Note 5		-86.26	-81.60	
	Bands TDD_E Note 5		-85.26	-80.60	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.2.12.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.12.2.1 Test purpose

To verify that TDD relative RSRQ measurement accuracy in carrier aggregation for 20MHz is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.12.2.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.12.2.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.12.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \le [27]dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.12.2.3-1: TDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.12.2.3-2.

Table 9.2.12.2.3-2: TDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.12.

9.2.12.2.4 Test description

9.2.12.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.12.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.12.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.12.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.12.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.12.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.12.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.12.2.5 Test requirement

Table 9.2.12.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.12.2.5-2.

Table 9.2.12.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-87.26	-82.60	
	Bands TDD_C Note 5		-86.26	-81.60	
	Bands TDD_E Note 5		-85.26	-80.60	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.6.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.2.12.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1

	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.13 Void

9.2.14 Void

9.2.15 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.2.15.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS within the specified limits.

9.2.15.1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.2.15.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.15.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [5]) and the CRS assistance information is valid throughout the entire evaluation period.

Table 9.2.15.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 5	Io Note 2 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	dBm/BW$_{Channel}$
±2.5	±4	≥-6.96	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-9.46	Note 3	Note 3	Note 3

NOTE 1: This Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: The gap between the Es/Iot level in TS 36.133 [4] table 9.1.5.3-1 and TS 36.133 [4] 9.1.5.2-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.15.1.3-2.

Table 9.2.15.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.3 and A.9.2.15.

9.2.15.1.4 Test description

9.2.15.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.2.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.15.1.4.3.

5. There is one E-UTRA FDD carrier and three cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.15.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PCell			Cell 1	Serving/aggressor cell
Neighbour cells			Cell 2	Neighbour/aggressor cell
			Cell 3	Cell to be measured
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For all cells in the test
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})mod6 = 0$ $(PCI_{cell2} - PCI_{cell3})mod6 != 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'10000000100000001000000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'10000000100000001000000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'01000000010000000100000001000000010000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	Only the CRS information of Cell 2 is provided in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.2.15.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.2.15.1.4.1-1 and Table 9.2.15.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell1 and Cell 2. In all test cases, Cell 1 is the serving/aggressor cell, Cell 2 is the neighbour/aggressor cell and Cell 3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Table 9.2.15.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 3 reported by the UE is compared to the actual RSRQ value according to Table 9.2.15.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.15.1.5-1 as appropriate.

9.2.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.2.15.1.4.3-1: Common Exception messages for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.2.15.1.4.3-2: *MeasResults*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.15.1.4.3-3: *MeasResultListEUTRA*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.15.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000010000000100 00000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

9.2.15.1.5 Test requirement

Table 9.2.15.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.15.1.5-2.

Table 9.2.15.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-		R.0 FDD	-		R.0 FDD	-	
PDSCH allocation		n_{PRB}	13—36	-		13—36	-		13—36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6FDD	OP.6 FDD
PBCH_RA		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note 1											
OCNG_RB Note 1											
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-84.76			-103.85			-116		
	Bands: FDD_B1, FDD_B2								-115.5		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-0.5	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-1.41	-0.77	-5.96	-0.89	0.24	-8.46
RSRP Note 3,4,5	Bands FDD_A	dBm/15 kHz	-80.76	-82.76	-85.26	-99.85	-101.85	-104.35	-112	-114	-119
	Bands: FDD_B1, FDD_B2								-111.5	-113.55	-118.5
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F Note 7								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5

$(\mathrm{RSRQ})_{meas}$ Note 3,4,5	Bands FDD_A, FDD_B1, FDD_B2, FDD_C, FDD_D, FDD_E, FDD_F Note 7, FDD_G, FDD_H	dB	-14.56	-11.99	-14.49	-14.56	-11.99	-14.49	-14.27	-11.09	-16.09
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-49.21	-52.87		-68.30	-71.96		-80.74	-84.83	
	Bands: FDD_B1, FDD_B2								-80.24	-84.33	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	
	Bands FDD_E, FDD_F Note 7								-78.74	-82.83	
	Bands FDD_G Note 9								-77.74	-81.83	
	Bands FDD_H								-77.24	-81.33	
Propagation condition		-	AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: Except Band 29 and Band 32.

Table 9.2.15.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 3)	RSRQ_05	RSRQ_05	RSRQ_00
Highest reported value (Cell 3)	RSRQ_17	RSRQ_17	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 3)	RSRQ_02	RSRQ_02	RSRQ_00
Highest reported value (Cell 3)	RSRQ_20	RSRQ_20	RSRQ_17

9.2.16 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.2.16.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS within the specified limits.

9.2.16.1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.2.16.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.16.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [5]) and the CRS assistance information is valid throughout the entire evaluation period.

Table 9.2.16.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Accuracy		Conditions			
Normal condition	Extreme condition	$\hat{E}s/Iot$ Note 5	Io Note 2 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	$dBm/BW_{Channel}$
±2.5	±4	≥-6.96	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-9.46	Note 3	Note 3	Note 3

NOTE 1: This Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: The gap between the Es/Iot level in TS 36.133 [4] table 9.1.5.3-1 and TS 36.133 [4] 9.1.5.2-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.16.1.3-2.

Table 9.2.16.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.3 and A.9.2.16.

9.2.16.1.4 Test description

9.2.16.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.2.16.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.16.1.4.3.

5. There is one E-UTRA TDD carrier and three cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.16.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PCell			Cell 1	Serving/aggressor cell
Neighbour cells			Cell 2	Neighbour/aggressor cell
			Cell3	Cell to be measured
Special subframe configuration			6	For Cell 1, Cell 2 and Cell 3. For special subframe configurations see Table 4.2-1 in 36.211 [9].
Uplink/downlink subframe configuration			1	For Cell 1, Cell 2 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in TS 36.211 [9].
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For all cells in the test
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})mod6 = 0$ $(PCI_{cell2} - PCI_{cell3})mod6 != 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'10000000001000000000'	Configured for Cell 1 measurements.
CRS assistance information	physCellId		see PCI conditions above	Only the CRS assistance information of cell 2 is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.2.16.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.2.16.1.4.1-1 and Table.9.2.16.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell3 and non-colliding CRS between Cell 1 and Cell 2. In all test cases, Cell 1 is the serving/aggressor cell, Cell 2 is the neighbour/aggressor cell and Cell 3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a

neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Table 9.2.16.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 3 reported by the UE is compared to the actual RSRQ value according to Table 9.2.16.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.16.1.5-1 as appropriate.

9.2.16.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.2.16.1.4.3-1: Common Exception messages for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.2.16.1.4.3-2: *MeasResults*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.16.1.4.3-3: *MeasResultListEUTRA*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.16.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

9.2.16.1.5 Test requirement

Table 9.2.16.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 9.2.16.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22-27			22-27			22-27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-		R.0 TDD	-		R.0 TDD	-	
PDSCH allocation		n_{PRB}	13-36	-		13—36	-		13-36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-84.76			-103.85			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-0.5	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ [Note 5]		dB	-1.41	-0.77	-5.96	-1.41	-0.77	-5.96	-0.89	0.24	-8.46
RSRP[Note3,4,5]	Bands TDD_A	dBm/15 kHz	-80.76	-82.76	-85.26	-99.85	-101.85	-104.35	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{RSRQ})_{meas}$ [Note3,4,5]	Bands TDD_A, TDD_C, TDD_E	dB	-14.56	-11.96	-14.49	-14.56	-11.99	-14.49	-14.27	-11.09	-16.09
$(\mathrm{Io})_{meas}$ [Note3]	Bands TDD_A	dBm/9 MHz	-49.21	-52.87		-68.30	-71.96		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition		-	AWGN			AWGN			AWGN		

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.16.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 3)	RSRQ_05	RSRQ_05	RSRQ_00
Highest reported value (Cell 3)	RSRQ_17	RSRQ_17	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 3)	RSRQ_02	RSRQ_02	RSRQ_00
Highest reported value (Cell 3)	RSRQ_20	RSRQ_20	RSRQ_17

9.2.17 FDD Intra frequency RSRQ Accuracy for 5MHz Bandwidth

9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth

9.2.17.1.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy for 5MHz Bandwidth is within the specified limit.

9.2.17.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support bands within band group FDD_N. Applicability requires support for FGI bit 16.

9.2.17.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.17.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.17.1.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.17.1.3-2.

Table 9.2.17.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1 and A.9.2.17.

9.2.17.1.4 Test description

9.2.17.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.17.1.4.2 Test procedure

Same test procedure as defined in clause 9.2.1.1.4.2 with the following exceptions:

- Instead of Table 9.2.1.1.5-2 → use Table 9.2.17.1.5-1.
- Instead of Table 9.2.2.1.5-3 → use Table 9.2.17.1.5-2.

9.2.17.1.4.3 Message contents

Same message contents as defined in clause 9.2.1.1.4.3.

9.2.17.1.5 Test requirement

Table 9.2.17.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.17.1.5-2.

Table 9.2.17.1.5-1: RSRQ FDD Intra frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10-15		10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_N	dBm/15 kHz	-82.81		-100.85		-109.5	
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.70	-4.70	-5.17	-5.17
RSRP[Note3]	Bands FDD_N	dBm/15 kHz	-79.81	-79.81	-103.75	-103.75	-113.10	-113.10
RSRQ[Note3]	Bands FDD_N	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io[Note3]	Bands FDD_N	dBm/4.5 MHz	-51.06		-73.01		-82.00	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.17.1.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.18 FDD - FDD Inter frequency RSRQ Accuracy for 5MHz Bandwidth

9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth

9.2.18.1.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for bands within band group FDD_N.

9.2.18.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.2.18.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.2.18.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.3 for a corresponding Band.

Table 9.2.18.1.3-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.18.1.3-2.

Table 9.2.18.1.3-2: FDD RSRQ absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1, clause 9.1.7 and A.9.2.18.

9.2.18.1.4 Test description

9.2.18.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.18.1.4.2 Test procedure

Same test procedure as defined in clause 9.2.3.1.4.2 with the following exceptions:

- Instead of Table 9.2.3.1.5-2 → use Table 9.2.18.1.5-1.
- Instead of Table 9.2.3.1.5-3 → use Table 9.2.18.1.5-2.

9.2.18.1.4.3 Message contents

Same message contents as defined in clause 9.2.3.1.4.3.

9.2.18.1.5 Test requirement

Table 9.2.18.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.18.1.5-2.

Table 9.2.18.1.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	5	5	5	5	5	5
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7—17	-	7—17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-77.0	-78.1	-101.70	-101.70	-119.5	N/A
	Bands FDD_C						-118.5	N/A
	Bands FDD_D						-118.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-117.5	N/A
	Bands FDD_G						-116.5	N/A
	Bands FDD_H						-116.0	N/A
	Bands FDD_N						- N/A	-112.7
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.00	-3.20	-4.00	-3.20
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-78.75	-79.85	-105.70	-104.90	-123.5	N/A
	Bands FDD_C						-122.5	N/A
	Bands FDD_D						-122.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-121.5	N/A
	Bands FDD_G						-120.5	N/A
	Bands FDD_H						-120.0	N/A
	Bands FDD_N						N/A	-115.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
	Bands FDD_N							
Io[Note3]	Bands FDD_A	dBm/4.5 MHz	-50.01	-51.11	-75.47	-75.23	-93.27	N/A
	Bands FDD_C						-92.27	N/A
	Bands FDD_D						-91.77	N/A
	Bands FDD_E, FDD_F [Note 5]						-91.27	N/A
	Bands FDD_G						-90.27	N/A
	Bands FDD_H						-89.77	N/A
	Bands FDD_N						N/A	-86.23

$\hat{E}_s / N_{oc}$	dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition	-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.
Note 7: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.18.1.5-2: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.18.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ for 5MHz Bandwidth

9.2.18.2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for bands within band group FDD_N.

9.2.18.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support bands within band group FDD_N. Applicability requires support for FGI bits 16 and 25.

9.2.18.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.18.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex B.3.4 for a corresponding Band.

$$\left| RSRP1 \right|_{dBm} - RSRP2 \left|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.18.2.3-1: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.18.2.3-2.

Table 9.2.18.2.3-2: FDD RSRQ relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2, clause 9.1.7 and A.9.2.18.

9.2.18.2.4 Test description

9.2.18.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.3.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.18.2.4.2 Test procedure

Same test procedure as defined in clause 9.2.3.2.4.2 with the following exceptions:

- Instead of Table 9.2.3.2.5-2 → use Table 9.2.18.2.5-1.
- Instead of Table 9.2.3.2.5-3 → use Table 9.2.18.2.5-2.

9.2.18.2.4.3 Message contents

Same message contents as defined in clause 9.2.3.2.4.3.

9.2.18.2.5 Test requirement

Table 9.2.18.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.18.2.5-2.

Table 9.2.18.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy for 5MHz bandwidth

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	5	5	5	5	5	5
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7—17	-	7—17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-78.1	-78.1	-101.70	-101.70	-119.5	N/A
	Bands FDD_C						-118.5	N/A
	Bands FDD_D						-118.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-117.5	N/A
	Bands FDD_G						-116.5	N/A
	Bands FDD_H						-116.0	N/A
	Bands FDD_N						- N/A	-112.7
$\hat{E}_s / I_{ot}$		dB	-1.75	-1.75	-4.00	-3.20	-4.00	-3.20
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-79.85	-79.85	-105.70	-104.90	-123.5	N/A
	Bands FDD_C						-122.5	N/A
	Bands FDD_D						-122.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-121.5	N/A
	Bands FDD_G						-120.5	N/A
	Bands FDD_H						-120.0	N/A
	Bands FDD_N						N/A	-115.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
	Bands FDD_N							
Io[Note3]	Bands FDD_A	dBm/4.5 MHz	-51.11	-51.11	-75.47	-75.23	-93.27	N/A
	Bands FDD_C						-92.27	N/A
	Bands FDD_D						-91.77	N/A
	Bands FDD_E, FDD_F [Note 5]						-91.27	N/A
	Bands FDD_G						-90.27	N/A
	Bands FDD_H						-89.77	N/A
	Bands FDD_N						N/A	-86.23

$\hat{E}_s / N_{oc}$	dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition	-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: This test is only applicable for testing inter-frequency requirements for bands within band group FDD_N. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.
Note 7: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.18.2.5-2: RSRQ FDD inter frequency relative accuracy requirements for 5MHz bandwidth for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 11	RSRQ_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.19 FDD-FDD Inter Frequency WB-RSRQ

9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

Exceptions for Message contents are FFS

The Test Tolerances and test requirements are undefined

9.2.19.1.1 Test purpose

To verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [5]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements.

9.2.19.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that support WB-RSRQ measurement. Applicability requires support for FGI bits 16 and 25.

9.2.19.1.3 Minimum conformance requirements

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. The WB-RSRQ accuracy figures in Table 9.2.19.1.3-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [5].

The accuracy requirements in Table 9.2.19.1.3-1 are valid under the following conditions:

The value of the parameter, *AllowedMeasBandwidth* in TS 36.331 [5], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band.

Table 9.2.19.1.3-1: WB-RSRQ Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot Note 3	Io1-Io2 Note 2	Io range Note 1		
				E-UTRA operating band groups Note 6	Minimum Io Note 5	Maximum Io
dB	dB	dB	dB		dBm/15kHz	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	0 ≤Io1-Io2	FDD_A, TDD_A	-121	-50
				FDD_C, TDD_C	-120	-50
				FDD_D	-119.5	-50
				FDD_E, TDD_E	-119	-50
				FDD_F	-118.5	-50
				FDD_G	-118	-50
				FDD_H	-117.5	-50
				FDD_N	-114.5	-50
±3.5	±4	≥-6 dB		Note 4	Note 4	Note 4

NOTE 1: Io is the average across all the resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5].
NOTE 2: Io1 is the Io level in the resource blocks other than central 6 resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5] and Io2 is the Io level in central 6 resource blocks. The Io1 and Io2 have the same range as defined for Io.
NOTE 3: Iot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.19.1.3-2.

Table 9.2.19.1.3-2: FDD WB-RSRQ absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.3 and A.9.2.19.

9.2.19.1.4 Test description

9.2.19.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.19.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.19.1.4.2 Test procedure

The test consists of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of WB-RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.19.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.19.1.5-1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

FFS

9.2.19.1.5 Test requirement

Table 9.2.19.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD WB-RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.19.1.5-2.

Table 9.2.19.1.5-1: WB-RSRQ FDD-FDD Inter frequency test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10	10	
Antenna Configuration			1x2	1x2	
Gap Pattern Id			0	-	
PBCH_RA		dB	0	0	
PBCH_RB				0	
PSS_RA				0	
SSS_RA				0	
PCFICH_RB				-∞	
PHICH_RA				-∞	
PHICH_RB				-∞	
PDCCH_RA				-∞	
PDCCH_RB				-∞	
PDSCH_RA				-∞	
PDSCH_RB				-∞	
OCNG_RA[Note1]				-∞	
OCNG_RB[Note1]				-∞	
AllowedMeasBandwidth in TS 36.331 [2]		RB	6	50	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	
PDSCH allocation		n_{PRB}	13-36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD	-	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	-	
I_{ot} [Note2]	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27
		dBm/15 kHz	-94 + TT	-87	-110 + TT
$\hat{E}_s / I_{ot}$	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27
		dB	-4 + TT	-3 + TT	20 + TT
RSRP[Note3]		dBm/15 kHz	-98	-90	
RSRQ[Note3]		dB	-16.25	-	
WB-$RSRQ_0$[Note3] in subframe 0		dB	-	-13.68	
WB-$RSRQ_1$[Note3] in subframe ≠ 0		dB	-	-13.63	
Io[Note3]		dBm/ 9 MHz	-64.76	-	
Io[Note3] in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz	-	-82.38	
Io[Note3] in symbol 7 of subframe 0		dBm/ 9 MHz	-	-82.20	
Io[Note3] in symbol 0, 4, 7, 11 of subframes ≠ 0		dBm/ 9 MHz	-	-82.38	
Propagation condition		-	AWGN	AWGN	

Note 1: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.

Note 3: RSRQ, RSRP, WB-RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: This test case is applicable to all FDD frequency bands except bands within band

group FDD_N.

Table 9.2.19.1.5-2: FDD WB-RSRQ accuracy for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS
Extreme Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.20 TDD-TDD Inter Frequency WB-RSRQ

9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

Exceptions for Message contents are FFS

The Test Tolerances and test requirements are undefined

9.2.20.1.1 Test purpose

To verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [5]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements.

9.2.20.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that support wideband RSRQ measurement. Applicability requires support for FGI bits 16 and 25.

9.2.20.1.3 Minimum conformance requirements

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. The WB-RSRQ accuracy figures in Table 9.2.20.1.3-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [5].

The accuracy requirements in Table 9.2.20.1.3-1 are valid under the following conditions:

The value of the parameter, *AllowedMeasBandwidth* in TS 36.331 [5], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band.

Table 9.2.20.1.3-1: WB-RSRQ Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot Note 3	Io1-Io2 Note 2	Io range Note 1		
				E-UTRA operating band groups Note 6	Minimum Io Note 5	Maximum Io
dB	dB	dB	dB		dBm/15kHz	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	0 ≤Io1-Io2	FDD_A, TDD_A	-121	-50
				FDD_C, TDD_C	-120	-50
				FDD_D	-119.5	-50
				FDD_E, TDD_E	-119	-50
				FDD_F	-118.5	-50
				FDD_G	-118	-50
				FDD_H	-117.5	-50
				FDD_N	-114.5	-50
±3.5	±4	≥-6 dB		Note 4	Note 4	Note 4

NOTE 1: Io is the average across all the resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5].
NOTE 2: Io1 is the Io level in the resource blocks other than central 6 resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5] and Io2 is the Io level in central 6 resource blocks. The Io1 and Io2 have the same range as defined for Io.
NOTE 3: Iot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.20.1.3-2.

Table 9.2.20.1.3-2: TDD WB-RSRQ absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.3 and A.9.2.20.

9.2.20.1.4 Test description

9.2.20.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.20.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.20.1.4.2 Test procedure

The test consists of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of WB-RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.20.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.20.1.5-1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

FFS

9.2.20.1.5 Test requirement

Table 9.2.10.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD WB-RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.20.1.5-2.

Table 9.2.20.1.5-1: WB-RSRQ TDD-TDD Inter frequency test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10	10	
Special subframe configuration Note1			6	6	
Uplink-downlink configuration Note1			1	1	
Antenna Configuration			1x2	1x2	
Gap Pattern Id			0	-	
PBCH_RA		dB	0	0	
PBCH_RB				0	
PSS_RA				0	
SSS_RA				0	
PCFICH_RB				-∞	
PHICH_RA				-∞	
PHICH_RB				-∞	
PDCCH_RA				-∞	
PDCCH_RB				-∞	
PDSCH_RA				-∞	
PDSCH_RB				-∞	
OCNG_RA Note2				-∞	
OCNG_RB Note2				-∞	
AllowedMeasBandwidth in TS 36.331 [2]		RB	6	50	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	
PDSCH allocation		n_{PRB}	13-36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD	-	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)			OP.1 TDD	-	
I_{ot} Note3	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27
		dBm/15 kHz	-94 + TT	-87 + TT	-110 + TT
$\hat{E}_s / I_{ot}$	bandwidth	n_{PRB}	0—49	0-21 28-49	22-27
		dB	-4 + TT	-3 + TT	20 + TT
RSRP Note4		dBm/15 kHz	-98	-90	
RSRQ Note4		dB	-16.25	-	
WB-$RSRQ_0$ Note4 in subframe 0		dB	-	-13.68	
WB-$RSRQ_1$ Note4 in subframe ≠ 0		dB	-	-13.63	
Io Note4		dBm/ 9 MHz	-64.76	-	
Io Note4 in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz	-	-82.38	
Io Note4 in symbol 7 of subframe 0		dBm/ 9 MHz	-	-82.20	
Io Note4 in symbol 0, 4, 7, 11 of subframes ≠ 0		dBm/ 9 MHz	-	-82.38	
Propagation condition		-	AWGN	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].
Note 2: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.
Note 4: RSRQ, RSRP, WB-RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7

	and 11 of the subframe.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.20.1.5--2: TDD WB-RSRQ accuracy for the reported values

	Test 1
	All Bands
Normal Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS
Extreme Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.21 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.1.1 Test purpose

Same test purpose as in clause 9.2.5.1.

9.2.21.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.21.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.1.3.

9.2.21.1.4 Test description

9.2.21.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.21.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.21.1.4.2 Test procedure

Same test procedure as in clause 9.2.5.1.4.2 with the following exceptions:

- Instead of Table 9.2.5.1.5-1 → use Table 9.2.21.1.5-1.

- Instead of Table 9.2.5.1.5-2 → use Table 9.2.21.1.5-2.

9.2.21.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.21.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.21.1.5 Test requirement

Table 9.2.21.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.21.1.5-2.

Table 9.2.21.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io^{Note2}	Bands FDD_A	dBm/9MHz	-90.26	N/A	
	Bands: FDD_B1, FDD_B2		-89.76		
	Bands FDD_C		-89.26		
	Bands FDD_D		-88.76		
	Bands FDD_E, FDD_F		-88.26		
	Bands FDD_G		-87.26		
	Bands FDD_H		-86.76		
	Bands FDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands: FDD_B1, FDD_B2			-88.12	
	Bands FDD_C			-87.62	
	Bands FDD_D			-87.12	
	Bands FDD_E, FDD_F			-86.62	
	Bands FDD_G			-85.62	
	Bands FDD_H			-85.12	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: See Table 9.2.5.1.5-1 for the other parameters.

Table 9.2.21.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.2.1 Test purpose

Same test purpose as in clause 9.2.5.2.1.

9.2.21.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.21.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.2.3.

9.2.21.2.4 Test description

9.2.21.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.21.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component

Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.21.2.4.2 Test procedure

Same test procedure as in clause 9.2.5.2.4.2 with the following exceptions:

- Instead of Table 9.2.5.2.5-1 → use Table 9.2.21.2.5-1.
- Instead of Table 9.2.5.2.5-2 → use Table 9.2.21.2.5-2.

9.2.21.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.21.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.21.2.5 Test requirement

Table 9.2.21.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.21.2.5-2.

Table 9.2.21.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9MHz	-90.26	N/A	
	Bands: FDD_B1, FDD_B2		-89.76		
	Bands FDD_C		-89.26		
	Bands FDD_D		-88.76		
	Bands FDD_E, FDD_F		-88.26		
	Bands FDD_G		-87.26		
	Bands FDD_H		-86.76		
	Bands FDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands: FDD_B1, FDD_B2			-88.12	
	Bands FDD_C			-87.62	
	Bands FDD_D			-87.12	
	Bands FDD_E, FDD_F			-86.62	
	Bands FDD_G			-85.62	
	Bands FDD_H			-85.12	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.5.2.5-1 for the other parameters					

Table 9.2.21.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x +9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.22 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.22.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.22.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.22.1.4 Test description

9.2.22.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.22.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.22.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.22.1.5-1.

- Instead of Table 9.2.6.1.5-2 → use Table 9.2.22.1.5-2.

9.2.22.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.22.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.22.1.5 Test requirement

Table 9.2.22.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.22.1.5-2.

Table 9.2.22.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.4TDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.11 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD), D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9MHz	-90.26	N/A	
	Bands TDD_C		-89.26		
	Bands TDD_E		-88.26		
	Bands TDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands TDD_C			-87.62	
	Bands TDD_E			-86.62	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves Note 3: See Table 9.2.6.1.5-1 for the other parameters					

Table 9.2.22.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.22.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.22.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.22.2.4 Test description

9.2.22.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.22.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component

Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.22.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.22.2.5-1.
- Instead of Table 9.2.6.2.5-2 → use Table 9.2.22.2.5-2.

9.2.22.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.22.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.22.2.5 Test requirement

Table 9.2.22.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.22.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.4TDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.11 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD), D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9MHz	-90.26	N/A	
	Bands TDD_C		-89.26		
	Bands TDD_E		-88.26		
	Bands TDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands TDD_C			-87.62	
	Bands TDD_E			-86.62	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.6.2.5-1 for the other parameters.					

Table 9.2.22.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.23 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.1.1 Test purpose

Same test purpose as in clause 9.2.5.1.

9.2.23.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.23.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.1.3.

9.2.23.1.4 Test description

9.2.23.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.23.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.23.1.4.2 Test procedure

Same test procedure as in clause 9.2.5.1.4.2 with the following exceptions:

- Instead of Table 9.2.5.1.5-1 → use Table 9.2.23.1.5-1.

- Instead of Table 9.2.5.1.5-2 → use Table 9.2.23.1.5-2.

9.2.23.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.23.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.23.1.5 Test requirement

Table 9.2.23.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.23.1.5-2.

Table 9.2.23.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16FDD
Io^{Note2}	Bands FDD_A Note 5	dBm/4.5MHz	-93.26	-88.62	
	Bands: FDD_B1, FDD_B2		-92.76	-88.12	
	Bands FDD_C Note 5		-92.26	-87.62	
	Bands FDD_D		-91.76	-87.12	
	Bands FDD_E, FDD_F Note 5		-91.26	-86.62	
	Bands FDD_G Note 5		-90.26	-85.62	
	Bands FDD_H Note 5		-89.76	-85.12	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.5.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.2.23.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.2.1 Test purpose

Same test purpose as in clause 9.2.5.2.1.

9.2.23.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.23.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.2.3.

9.2.23.2.4 Test description

9.2.23.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.23.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.23.2.4.2 Test procedure

Same test procedure as in clause 9.2.5.2.4.2 with the following exceptions:

- Instead of Table 9.2.5.2.5-1 → use Table 9.2.23.2.5-1.

- Instead of Table 9.2.5.2.5-2 → use Table 9.2.23.2.5-2.

9.2.23.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.23.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.23.2.5 Test requirement

Table 9.2.23.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.23.2.5-2.

Table 9.2.23.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5MHz	-93.26	-88.62	
	Bands: FDD_B1, FDD_B2		-92.76	-88.12	
	Bands FDD_C Note 5		-92.26	-87.62	
	Bands FDD_D		-91.76	-87.12	
	Bands FDD_E, FDD_F Note 5		-91.26	-86.62	
	Bands FDD_G Note 5		-90.26	-85.62	
	Bands FDD_H Note 5		-89.76	-85.12	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.5.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.2.23.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.24 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.24.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.24.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.24.1.4 Test description

9.2.24.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.24.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.24.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.24.1.5-1.

- Instead of Table 9.2.6.1.5-2 → use Table 9.2.24.1.5-2.

9.2.24.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.24.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.24.1.5 Test requirement

Table 9.2.24.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.24.1.5-2.

Table 9.2.24.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.2.1			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD	R.11 TDD	R.11 TDD
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm4.5MHz	-93.26	-88.62	
	Bands TDD_C Note 5		-92.26	-87.62	
	Bands TDD_E Note 5		-91.26	-86.62	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves
Note 3: See Table 9.2.6.1.5-1 for the other parameters
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.2.24.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.24.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.24.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.24.2.4 Test description

9.2.24.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.24.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.24.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.24.2.5-1.
- Instead of Table 9.2.6.2.5-2 → use Table 9.2.24.2.5-2.

9.2.24.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.24.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.24.2.5 Test requirement

Table 9.2.24.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.24.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.2.1			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD	R.11 TDD	R.11 TDD
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm4.5MHz	-93.26	-88.62	
	Bands TDD_C Note 5		-92.26	-87.62	
	Bands TDD_E Note 5		-91.26	-86.62	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.2.24.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.25 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.1.1 Test purpose

To verify that FDD and TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the TDD absolute RSRQ accuracy requirements of the secondary component carrier.

9.2.25.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.2.25.1.3 Minimum conformance requirements

The RSRQ measurement of an FDD cell on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurement of a TDD cell on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.25.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.25.1.3-1: RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.25.1.3-2.

Table 9.2.25.1.3-2: RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.25.

9.2.25.1.4 Test description

9.2.25.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.25.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.25.1.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA FDD carrier and one cell on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.25.1.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.25.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.25.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.25.1.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.25.1.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.25.1.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.25.1.5 Test requirement

Table 9.2.25.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.25.1.5-2.

Table 9.2.25.1.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in FDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			-	6
Uplink-downlink configuration Note1			-	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-	-116
	Bands TDD_C		-	-115
	Bands TDD_E		-	-114
	Bands FDD_A		-119.2	-
	Bands FDD_B1, FDD_B2		-118.7	-
	Bands FDD_C		-118.2	-
	Bands FDD_D		-117.7	-
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-
	Bands FDD_G		-116.2	-
	Bands FDD_H		-115.7	-
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-	-121.2
	Bands TDD_C		-	-120.2
	Bands TDD_E		-	-119.2
	Bands FDD_A		-124.4	-
	Bands FDD_B1, FDD_B2		-123.9	-

	Bands FDD_C		-123.4	-
	Bands FDD_D		-122.9	-
	Bands FDD_E, Bands FDD_F Note 6		-122.4	-
	Bands FDD_G		-121.4	-
	Bands FDD_H		-120.9	-
RSRQ Note4	Bands TDD_A	dB	-	-17.14
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.14	-
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	$dBm/BW_{channel}$	-87.07 + $10\log(N_{RB,c}/50)$	
	Bands TDD_C		-86.07 + $10\log(N_{RB,c}/50)$	
	Bands TDD_E		-85.07 + $10\log(N_{RB,c}/50)$	
	Bands FDD_A		-90.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_B1, FDD_B2		-89.77 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_C		-89.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_D		-88.77 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_G		-87.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_H		-86.77 + $10\log(N_{RB,c}/50)$	-
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.25.1.5-2: RSRQ absolute accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in FDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.2.1 Test purpose

To verify that TDD-FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD-FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.25.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.2.25.2.3 Minimum conformance requirements

The RSRQ measurement of a TDD cell on the secondary component carrier is compared with the RSRQ measurement of an FDD cell on the primary component carrier, and shall meet the applicable relative accuracy requirements which are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.25.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.25.2.3-1: RSRQ Inter-frequency relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.25.2.3-2.

Table 9.2.25.2.3-2: RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.25.

9.2.25.2.4 Test description

9.2.25.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.25.2.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.25.2.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA FDD carrier and one cell on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.25.2.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2)is configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured from the secondary component carrier (Cell 2) compared with the RSRQ measured from the primary component carrier (Cell 1).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.25.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.25.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.25.2.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.25.2.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.25.2.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.25.2.5 Test requirement

Table 9.2.25.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.25.2.5-2.

Table 9.2.25.2.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in FDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			-	6
Uplink-downlink configuration Note1			-	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-	-116
	Bands TDD_C		-	-115
	Bands TDD_E		-	-114
	Bands FDD_A		-119.2	-
	Bands FDD_B1, FDD_B2		-118.7	-
	Bands FDD_C		-118.2	-
	Bands FDD_D		-117.7	-
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-
	Bands FDD_G		-116.2	-
	Bands FDD_H		-115.7	-
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-	-121.2
	Bands TDD_C		-	-120.2
	Bands TDD_E		-	-119.2
	Bands FDD_A		-124.4	-
	Bands FDD_B1, FDD_B2		-123.9	-

	Bands FDD_C		-123.4	-
	Bands FDD_D		-122.9	-
	Bands FDD_E, Bands FDD_F Note 6		-122.4	-
	Bands FDD_G		-121.4	-
	Bands FDD_H		-120.9	-
RSRQ Note4	Bands TDD_A	dB	-	-17.14
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.14	-
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	$dBm/BW_{channel}$	-87.07 + $10\log(N_{RB,c}/50)$	
	Bands TDD_C		-86.07 + $10\log(N_{RB,c}/50)$	
	Bands TDD_E		-85.07 + $10\log(N_{RB,c}/50)$	
	Bands FDD_A		-90.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_B1, FDD_B2		-89.77 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_C		-89.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_D		-88.77 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_G		-87.27 + $10\log(N_{RB,c}/50)$	-
	Bands FDD_H		-86.77 + $10\log(N_{RB,c}/50)$	-
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.25.2.5-2: RSRQ relative accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in FDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 10
Highest reported value (Cell 2)	RSRQ_x + 10
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.26 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.1.1 Test purpose

To verify that FDD and TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the FDD absolute RSRQ accuracy requirements of the secondary component carrier.

9.2.26.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.2.26.1.3 Minimum conformance requirements

The RSRQ measurement of a TDD cell on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurement of an FDD cell on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.26.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.26.1.3-1: RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.26.1.3-2.

Table 9.2.26.1.3-2: RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.26.

9.2.26.1.4 Test description

9.2.26.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.26.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.26.1.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA TDD carrier and one cell on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCCand Cell 2 is the SCell on the Secondary Component Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.26.1.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.26.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.26.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.26.1.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.26.1.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.26.1.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.26.1.5 Test requirement

Table 9.2.26.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.26.1.5-2.

Table 9.2.26.1.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in TDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			6	-
Uplink-downlink configuration Note1			1	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.2	-
	Bands TDD_C		-118.2	-
	Bands TDD_E		-117.2	-
	Bands FDD_A		-	-116
	Bands FDD_B1, FDD_B2		-	-115.5
	Bands FDD_C		-	-115
	Bands FDD_D		-	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-	-114
	Bands FDD_G		-	-113
	Bands FDD_H		-	-112.5
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-124.4	-
	Bands TDD_C		-123.4	-
	Bands TDD_E		-122.4	-
	Bands FDD_A		-	-121.2
	Bands FDD_B1, FDD_B2		-	-120.7

	Bands FDD_C		-	-120.2
	Bands FDD_D		-	-119.7
	Bands FDD_E, Bands FDD_F Note 6		-	-119.2
	Bands FDD_G		-	-118.2
	Bands FDD_H		-	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-	-17.14
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	dBm/BW$_{channel}$	-90.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_C		-89.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_E		-88.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_A		-	-87.07 + 10log($N_{RB,c}$/50)
	Bands FDD_B1, FDD_B2			-86.57 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-	-86.07 + 10log($N_{RB,c}$/50)
	Bands FDD_D		-	-85.57 + 10log($N_{RB,c}$/50)
	Bands FDD_E, Bands FDD_F Note 6		-	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_G		-	-84.07 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-	-83.57 + 10log($N_{RB,c}$/50)
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.26.1.5-2: RSRQ absolute accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in TDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.2.1 Test purpose

To verify that TDD-FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD-FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.26.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.2.26.2.3 Minimum conformance requirements

The RSRQ measurement of an FDD cell on the secondary component carrier is compared with the RSRQ measurement of a TDD cell on the primary component carrier, and shall meet the applicable relative accuracy requirements which are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.26.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.26.2.3-1: RSRQ Inter-frequency relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.26.2.3-2.

Table 9.2.26.2.3-2: RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.26.

9.2.26.2.4 Test description

9.2.26.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.26.2.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.26.2.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA TDD carrier and one cell on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.26.2.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured from the secondary component carrier (Cell 2) compared with the RSRQ measured from the primary component carrier (Cell 1).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.26.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.26.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.26.2.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.26.2.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.26.2.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.26.2.5 Test requirement

Table 9.2.26.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.26.2.5-2.

Table 9.2.26.2.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in TDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			6	-
Uplink-downlink configuration Note1			1	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.2	-
	Bands TDD_C		-118.2	-
	Bands TDD_E		-117.2	-
	Bands FDD_A		-	-116
	Bands FDD_B1, FDD_B2		-	-115.5
	Bands FDD_C		-	-115
	Bands FDD_D		-	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-	-114
	Bands FDD_G		-	-113
	Bands FDD_H		-	-112.5
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-124.4	-
	Bands TDD_C		-123.4	-
	Bands TDD_E		-122.4	-
	Bands FDD_A		-	-121.2
	Bands FDD_B1, FDD_B2		-	-120.7

	Bands FDD_C		-	-120.2
	Bands FDD_D		-	-119.7
	Bands FDD_E, Bands FDD_F Note 6		-	-119.2
	Bands FDD_G		-	-118.2
	Bands FDD_H		-	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-	-17.14
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	dBm/BW channel	-90.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_C		-89.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_E		-88.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_A		-	-87.07 + 10log($N_{RB,c}$/50)
	Bands FDD_B1, FDD_B2			-86.57 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-	-86.07 + 10log($N_{RB,c}$/50)
	Bands FDD_D		-	-85.57 + 10log($N_{RB,c}$/50)
	Bands FDD_E, Bands FDD_F Note 6		-	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_G		-	-84.07 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-	-83.57 + 10log($N_{RB,c}$/50)
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.26.2.5-2: RSRQ relative accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in TDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 10
Highest reported value (Cell 2)	RSRQ_x + 10
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.27 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.27.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.27.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.27.1.4 Test description

9.2.27.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.2.27.1.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

- For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

- For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.27.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.27.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.27.1.5-1.

- Instead of Table 9.2.6.1.5-2 → use Table 9.2.27.1.5-2.

9.2.27.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.27.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 20MHz+10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.27.1.5 Test requirement

Table 9.2.27.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.27.1.5-2.

Table 9.2.27.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz+10MHz

Parameters	Units	Combination	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1	MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
		10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth	n_{PRB}	20MHz+10MHz	47-52	22-27	
		10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.1.2		20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
		10MHz+20MHz	R.0 TDD	R.3 TDD	
PDSCH allocation	n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
		10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		20MHz+10MHz	R.10 TDD	R.6 TDD	R.6 TDD
		10MHz+20MHz	R.6 TDD	R.10 TDD	R.10 TDD

OCNG Patterns defined in D.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io^{Note2}	Bands TDD_A	dBm/$BW_{channel}$	All	-90.26 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-89.26 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-88.26 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/$BW_{channel}$	All	N/A	-85.61 + 10log($N_{RB,c}$/50)	
	Bands TDD_C				-84.61 + 10log($N_{RB,c}$/50)	
	Bands TDD_E				-83.61 + 10log($N_{RB,c}$/50)	
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.						
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						
NOTE 3: See Table 9.2.6.1.5-1 for the other parameters.						

Table 9.2.27.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz+10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.27.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.27.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.27.2.4 Test description

9.2.27.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.2.27.2.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.27.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.27.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.27.2.5-1.

- Instead of Table 9.2.6.2.5-2 → use Table 9.2.27.2.5-2.

9.2.27.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.27.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 20MHz+10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.27.2.5 Test requirement

Table 9.2.27.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.27.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 20MHz+10MHz

Parameters		Units	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R.3 TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	R.6 TDD
			10MHz+20MHz	R.6 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	dBm/$BW_{channel}$	All	-90.26 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-89.26 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-88.26 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/$BW_{channel}$	All	N/A	-85.61 + 10log($N_{RB,c}$/50)	
	Bands TDD_C				-84.61 + 10log($N_{RB,c}$/50)	
	Bands TDD_E				-83.61 + 10log($N_{RB,c}$/50)	

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.2.6.1.5-1 for the other parameters.

Table 9.2.27.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz+10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

9.2.28.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits.

9.2.28.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.2.28.3 Minimum conformance requirements

Intra-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.5.1.

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.2.28.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.28.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.2.28.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.28.3-2: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

Note: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.4, clause 9.1.7 and A.9.2.28.

9.2.28.4 Test description

9.2.28.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 for UE with 2Rx RF band and Annex A, Figure A.78a (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.28.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.28.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.28.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.28.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

9.2.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.28.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.28.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.28.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.28.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.28.5 Test requirement

Table 9.2.28.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.28.5-2.

Table 9.2.28.5-1: RSRQ FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Measurement bandwidth		n_{PRB}	22—27	
DMTC period		ms	N/A	160
DMTC period offset		ms	N/A	10
Discovery signal occasion duration		ms	N/A	1
Time offset between cell 1 and cell 2		µs	0	2.3
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	*13—36*	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-116	
	Bands FDD_B1, FDD_B2		-115.5	
	Bands FDD_C		-115	
	Bands FDD_D		-114.5	
	Bands FDD_E, FDD_F [Note 5]		-114	
	Bands FDD_G [Note 7]		-113	
	Bands FDD_H		-112.5	
$\hat{E}_s / I_{ot}$		dB	-5.17	-5.17
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-119.60	-119.60
	Bands FDD_B1, FDD_B2		-119.10	-119.10
	Bands FDD_C		-118.60	-118.60
	Bands FDD_D		-118.10	-118.10
	Bands FDD_E, FDD_F [Note 5]		-117.60	-117.60
	Bands FDD_G [Note 7]		-116.60	-116.60
	Bands FDD_H		-116.10	-116.10
RSRQ[Note3]	Bands FDD_A	dB	-17.12	-17.12
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 5]			
	Bands FDD_G [Note 7]			
	Bands FDD_H			
Io[Note3]	Bands FDD_A	dBm/9 MHz	-85.49	
	Bands FDD_B1, FDD_B2		-84.99	
	Bands FDD_C		-84.49	
	Bands FDD_D		-83.99	
	Bands FDD_E, FDD_F [Note 5]		-83.49	
	Bands FDD_G [Note 7]		-82.49	
	Bands FDD_H		-81.99	
$\hat{E}_s / N_{oc}$		dB	-3.60	-3.60
Propagation condition		-	AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

Table 9.2.28.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1 All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

9.2.29.1 Test purpose

Same test purpose as in clause 9.2.28.1.

9.2.29.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.2.29.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.4, clause 9.1.7 and A.9.2.29.

9.2.29.4 Test description

9.2.29.4.1 Initial conditions

Same initial conditions as in clause 9.2.28.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.29.4.3.

9.2.29.4.2 Test procedure

Same test procedure as in clause 9.2.28.4.2 with the following exceptions:

- Instead of Table 9.2.28.5-1 → use Table 9.2.29.5-1.

- Instead of Table 9.2.28.5-2 → use Table 9.2.29.5-2.

9.2.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.29.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.29.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.29.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.29.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.29.5 Test requirement

Table 9.2.29.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.29.5-2.

Table 9.2.29.5-1: RSRQ TDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Measurement bandwidth		n_{PRB}	22—27	
DMTC period		ms	N/A	160
DMTC period offset		ms	N/A	10
Discovery signal occasion duration		ms	N/A	2
Time offset between cell 1 and cell 2		µs	0	2.3
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-116	
	Bands TDD_C		-115	
	Bands TDD_E		-114	
$\hat{E}_s / I_{ot}$		dB	-5.17	-5.17
RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-119.60	-119.60
	Bands TDD_C		-118.60	-118.60
	Bands TDD_E		-117.60	-117.60
RSRQ[Note3]	Bands TDD_A	dB	-17.12	-17.12
	Bands TDD_C			
	Bands TDD_E			
Io[Note3]	Bands TDD_A	dBm/9 MHz	-85.49	
	Bands TDD_C		-84.49	
	Bands TDD_E		-83.49	
$\hat{E}_s / N_{oc}$		dB	-3.60	-3.60
Propagation condition		-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver

	antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.29.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1 All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

9.2.30.1 Test purpose

The purpose of this test is to verify that the RSRQ absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.2.30.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.2.30.3 Minimum conformance requirements

Inter-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.6.1. Inter-frequency relative RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS 36.133 [4] Section 9.1.6.2.

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.2.30.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.3 for a corresponding Band

Table 9.2.30.3-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.30.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.30.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table I.4.2 and I.4.3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.30.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.6 and A.9.2.30.

9.2.30.4 Test description

9.2.30.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.30.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.30.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.30.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages.
   The reported RSRQ value of Cell 2 reported by the UE is compared to actual RSRQ value according to Table 9.2.30.5-2. This counts as a Pass or Fail for the events "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.30.5-3. This counts as a Pass or Fail for the events "Cell 1-2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1" and "Cell 1-2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.30.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.30.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.30.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.30.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.30.5 Test requirement

Table 9.2.30.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.2.30.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.2.30.5-3.

Table 9.2.30.5-1: RSRQ in discovery signal occasions FDD—FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
Gap Offset		ms	9	-
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	1
Time offset between cell 2 and cell 1		µs	3	
Measurement bandwidth		n_{PRB}	22-27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13-36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-117.5	-117.2
	Bands FDD_B1, FDD_B2		-117	-116.7
	Bands FDD_C		-116.5	-116.2
	Bands FDD_D		-116	-115.7
	Bands FDD_E, FDD_F [Note 5]		-115.5	-115.2
	Bands FDD_G [Note 7]		-114.5	-114.2
	Bands FDD_H		-114	-113.7
$\hat{E}_s / I_{ot}$		dB	-5.20	-5.20
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-122.70	-122.40
	Bands FDD_B1, FDD_B2		-122.20	-121.90
	Bands FDD_C		-121.70	-121.40
	Bands FDD_D		-121.20	-120.90
	Bands FDD_E, FDD_F [Note 5]		-120.70	-120.40
	Bands FDD_G [Note 7]		-119.70	-119.40
	Bands FDD_H		-119.20	-118.90
RSRQ[Note3]	Bands FDD_A	dB	-17.14	-17.14
	Bands FDD_B1, FDD_B2			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F [Note 5]			
	Bands FDD_G [Note 7]			
	Bands FDD_H			
Io[Note3]	Bands FDD_A	dBm/ 9 MHz	-88.57	-88.27
	Bands FDD_B1, FDD_B2		-88.07	-87.77
	Bands FDD_C		-87.57	-87.27

	Bands FDD_D		-87.07	-86.77
	Bands FDD_E, FDD_F Note 5		-86.57	-86.27
	Bands FDD_G Note 7		-85.57	-85.27
	Bands FDD_H		-85.07	-84.77
$\hat{E}_s / N_{oc}$		dB	-5.20	-5.20
Propagation condition		-	AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.
Note 7: Except Band 29 and Band 32.

Table 9.2.30.5-2: RSRQ FDD Inter frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_15

Table 9.2.30.5-3: RSRQ FDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

9.2.31.1 Test purpose

Same test purpose as in clause 9.2.30.1.

9.2.31.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.2.31.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.30.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.7 and A.9.2.31.

9.2.31.4 Test description

9.2.31.4.1 Initial conditions

Same initial conditions as in clause 9.2.30.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.31.4.3.

9.2.31.4.2 Test procedure

Same test procedure as in clause 9.2.30.4.2 with the following exceptions:

- Instead of Table 9.2.30.5-1 → use Table 9.2.31.5-1.
- Instead of Table 9.2.30.5-2 → use Table 9.2.31.5-2.
- Instead of Table 9.2.30.5-3 → use Table 9.2.31.5-3.

9.2.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.31.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.31.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.31.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.31.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.31.5 Test requirement

Table 9.2.31.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.2.31.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.2.31.5-3.

Table 9.2.31.5-1: RSRQ TDD—TDD Inter frequency test parameters for TDD configuration 1

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
Gap Offset			9	-
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	2
Time offset between cells		µs	0	3
Special subframe configuration Note1			6	
Uplink-downlink configuration Note1			1	
Measurement bandwidth		n_{PRB}	22-27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-117.50	-117.20
	Bands TDD_C		-116.50	-116.20
	Bands TDD_E		-115.50	-115.20
$\hat{E}_s / I_{ot}$		dB	-5.20	-5.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-122.70	-122.40
	Bands TDD_C		-121.70	-121.40
	Bands TDD_E		-120.70	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-17.14	-17.14
Io Note4	Bands TDD_A	dBm/9 MHz	-88.57	-88.27
	Bands TDD_C		-87.57	-87.27
	Bands TDD_E		-86.57	-86.27
$\hat{E}_s / N_{oc}$		dB	-5.20	-5.20
Propagation condition		-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent

	interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.31.5-2: RSRQ TDD Inter frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_15

Table 9.2.31.5-3: RSRQ TDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.2.32.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions.

9.2.32.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.2.32.3 Minimum conformance requirements

RSRQ measurement of cells on the primary component carrier or any of the secondary component carrier(s) in discovery signal occasions shall meet the intrafrequency absolute accuracy requirements in TS 36.133 [4] section 9.1.5.1.

The accuracy requirements in Table 9.2.32.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.32.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements in TS 36.133 [4] sections 9.1.6.2.

The accuracy requirements in Table 9.2.32.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.32.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table I.4.2 and I.4.3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.30.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.4, clause 9.1.7 and A.9.2.32.

9.2.32.4 Test description

9.2.32.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.32.4.3.

4. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.32.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.2.32.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRQ value of Cell 3 reported by the UE is compared to actual RSRP value according to Table 9.2.32.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

   The reported RSRQ value for Cell 3 is compared to the reported RSRP value for Cell1 for each MeasurementReport message according to Table 9.2.32.5-3. This counts as a Pass or Fail for the events “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

9.2.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.32.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.32.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.32.5 Test requirement

Table 9.2.32.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.32.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in table 9.2.32.5-3.

Table 9.2.32.5-1: FDD RSRQ Carrier Aggregation Test Parameters

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
DMTC period			N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration			N/A	N/A	1
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note1]					
OCNG_RB[Note1]					
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-119.5	-116	-116
	Bands FDD_C		-118.5	-115	-115
	Bands FDD_D		-118	-114.5	-114.5
	Bands FDD_E, FDD_F [Note 6]		-117.5	-114	-114
	Bands FDD_G		-116.5	-113	-113
	Bands FDD_H		-116	-112.5	-112.5+
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.54	-5.16
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-123.5	-120	-119.70
	Bands FDD_C		-122.5	-119	-118.70
	Bands FDD_D		-122	-118.5	-118.20
	Bands FDD_E, FDD_F [Note 6]		-121.5	-118	-117.70
	Bands FDD_G		-120.5	-117	-116.70
	Bands FDD_H		-120	-116.5	-116.20
RSRQ[Note3]	Bands FDD_A	dB	-16.25	-17.40	-17.10
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F [Note 6]				
	Bands FDD_G				
	Bands FDD_H				
Io[Note3]	Bands FDD_A	dBm/9	-90.26	-85.61	-85.61

	Bands FDD_C	MHz	-89.26	-84.61	-84.61
	Bands FDD_D		-88.76	-84.11	-84.11
	Bands FDD_E, FDD_F Note 6		-88.26	-83.61	-83.61
	Bands FDD_G		-87.26	-82.61	-82.61
	Bands FDD_H		-86.76	-82.17+TT	-82.17+TT
$\hat{E}_s / N_{oc}$		dB	-4.0	-4.0	-3.70
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.32.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.32.5-3: RSRQ FDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 - 13
Highest reported value (Cell 3)		RSRQ_Cell 1 + 8
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 - 13
Highest reported value (Cell 3)		RSRQ_Cell 1 + 8

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.2.33.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions.

9.2.33.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.2.33.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.32.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.4, clause 9.1.7 and A.9.2.33.

9.2.33.4 Test description

9.2.33.4.1 Initial conditions

Same initial conditions as in clause 9.2.32.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.33.4.3.

9.2.33.4.2 Test procedure

Same test procedure as in clause 9.2.32.4.2 with the following exceptions:

- Instead of Table 9.2.32.5-1 → use Table 9.2.33.5-1.
- Instead of Table 9.2.32.5-2 → use Table 9.2.33.5-2.
- Instead of Table 9.2.32.5-3 → use Table 9.2.33.5-3

9.2.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.33.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.33.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.33.5 Test requirement

Table 9.2.33.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.33.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in table 9.2.33.5-3.

Table 9.2.33.5-1: TDD RSRQ Carrier Aggregation Test Parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
DMTC period			N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration			N/A	N/A	1
Timing offset to cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s / I_{ot}$		dB	-4.0	-5.54	-5.16
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.5	-120	-119.70
	Bands TDD_C		-122.5	-119	-118.70
	Bands TDD_E		-121.5	-118	-117.70
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-16.25	-17.40	-17.10
Io[Note4]	Bands TDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_C		-89.26	-84.61	
	Bands TDD_E		-88.26	-83.61	
$\hat{E}_s / N_{oc}$		dB	-4.0	-4.0	-3.70
Propagation condition		-	AWGN		

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.33.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.33.5-3: RSRQ TDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 - 13
Highest reported value (Cell 3)		RSRQ_Cell 1 + 8
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 - 13
Highest reported value (Cell 3)		RSRQ_Cell 1 + 8

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.34 to 9.2.37

9.2.38 to 9.2.41 Void

9.2.42 FD-FDD RSRQ Intra frequency case for UE category 0

9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

9.2.42.1.1 Test purpose

To verify the FD-FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.42.1.2 Test applicability

This test applies to all types of E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.42.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.42.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.42.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.42.1.

9.2.42.1.4 Test description

9.2.42.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.42.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.42.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.42.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.42.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.42.1.5-1 as appropriate.

9.2.42.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.42.1.4.3-1: Common Exception messages for RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.42.1.4.3-2: *MeasResults*: Additional RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.42.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.42.1.5 Test requirement

Table 9.2.42.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.42.1.5-2.

Table 9.2.42.1.5-1: FD-FDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s / I_{ot}$		dB	- 1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands FDD_B1, FDD_B2						-119.10	-119.10
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F Note 4						-117.60	-117.60
	Bands FDD_G Note 6						-116.60	-116.60T
	Bands FDD_H						-116.10	-116.10
RSRQ Note3	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	Bands FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 45							
	Bands FDD_G Note 6							
	Bands FDD_H							
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands FDD_B1,						-84.99	

	FDD_B2				
	Bands FDD_C				-84.49
	Bands FDD_D				-83.99
	Bands FDD_E, FDD_F Note 4				-83.49
	Bands FDD_G Note 6				-82.49
	Bands FDD_H				-81.99
Propagation condition		-	AWGN	AWGN	AWGN
Correlation Matrix and Antenna Configuration			1x1	1x1	1x1

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.2.42.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.43 HD-FDD RSRQ Intra frequency case for UE category 0

9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

9.2.43.1.1 Test purpose

To verify the HD-FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.43.1.2 Test applicability

This test applies to all types of E-UTRA HD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.43.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.43.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.1 for a corresponding Band.

- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.43.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.43.1.

9.2.43.1.4 Test description

9.2.43.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.43.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.43.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.43.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table

9.2.43.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.43.1.5-1 as appropriate.

9.2.43.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.43.1.4.3-1: Common Exception messages for RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.43.1.4.3-2: *MeasResults*: Additional RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.43.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.43.1.5 Test requirement

Table 9.2.43.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.43.1.5-2.

Table 9.2.43.1.5-1: HD-FDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands FDD_B1, FDD_B2						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 4						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands FDD_B1, FDD_B2						-119.10	-119.10
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F Note 4						-117.60	-117.60
	Bands FDD_G Note 6						-116.60	-116.60
	Bands FDD_H						-116.10	-116.10
RSRQ Note3	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	Bands FDD_B1, FDD_B2							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 4							
	Bands FDD_G Note 6							
	Bands FDD_H							
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands FDD_B1,						-84.99	

	FDD_B2				
	Bands FDD_C				-84.49
	Bands FDD_D				-83.99
	Bands FDD_E, FDD_F Note 4				-83.49
	Bands FDD_G Note 6				-82.49
	Bands FDD_H				-81.99
Propagation condition		-	AWGN	AWGN	AWGN
Correlation Matrix and Antenna Configuration			1x1	1x1	1x1

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.2.43.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.44 TDD RSRQ Intra frequency case for UE category 0

9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

9.2.44.1.1 Test purpose

To verify the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.44.1.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.44.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.44.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

- RSRP|dBm according to Annex B.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.44.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.44.1.

9.2.44.1.4 Test description

9.2.44.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.44.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.44.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.44.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.44.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.44.1.5-1 as appropriate.

9.2.44.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.44.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.44.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.44.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.44.1.5 Test requirement

Table 9.2.44.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.44.1.5-2.Table 9.2.44.1.5-1: TDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink-downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s / I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands TDD_C						-118.60	-118.60
	Bands TDD_E						-117.60	-117.60
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands TDD_C						-84.49	
	Bands TDD_E						-83.49	

Propagation condition	-	AWGN	AWGN	AWGN
Correlation Matrix and Antenna Configuration		1x1	1x1	1x1

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.44.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.45 to 9.2.50 Void

9.2.51 FS3 Intra frequency absolute and relative RSRQ accuracies with FDD PCell

9.2.51.1 Test purpose

The purpose of this test is to verify that the FDD intra frequency RSRQ absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRQ accuracy requirement of the secondary component carrier defined in clause 9.1.19.2 of TS 36.133. The test will also verify the primary and secondary component carrier relative RSRQ accuracy requirement defined in Clause 9.1.19.4 of TS 36.133.

9.2.51.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 13 and forward that support downlink LAAwith FDD as PCell.

9.2.51.3 Minimum conformance requirements

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on one SCC.

Absolute RSRQ measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.3.4 in TS 36.133.

The accuracy requirements in Table 9.2.51.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.2 of [4] for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.51.3-1: RSRQ intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FS3_G	-118	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.51.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex B.3.24.2 of [4]for a corresponding Band.

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.51.3-1: RSRQ inter-frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FS3_G	-118	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7-1: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE 2: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.19.2, 9.1.19.3 and A.9.2.51.

9.2.51.4 Test description

9.2.51.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.51.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1 Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.51.4.3.

4. Cell 1 is PCell in FDD on the primary component carrier, Cell 2 is SCell on SCC1 with frame structure 3, and Cell 3 is a neighbouring cell on the same CC as Cell2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.51.4.2 Test procedure

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier with frame structure 3 and activated, and Cell3 is the neighbouring cell on the same secondary component carrier of Cell2. The test parameters are given in Table 9.2.51.5-1. The DMTC configuration for Cell2 and Cell3 is provided to the UE in the *measDS-Config* before the start of the test in test procedure step 8.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.51.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.51.5-2. This counts respectively as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations for the respective event ”Cell 3” is increased by one.

   The reported RSRQ values for Cell3 are compared to the reported RSRQ value for other cells for each MeasurementReport message according to Table 9.2.51.5-3. These count respectively as a Pass or Fail for the event “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 1-3”, is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If both events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.51.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.51.4.3-1: Common Exception messages for FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.51.4.3-2: *MeasDS-Config*: Additional Exception messages for FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirement

Derivation Path: 36.508, clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
Ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		LAA SCell
}			
measCSI-RS-ToRemoveList-r12	Not present		
measCSI-RS-ToAddModList-r12	Not present		
}			
}			
}			

9.2.51.5 Test requirement

Table 9.2.51.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.51.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.51.5-3.

Table 9.2.51.5-1: Test parameters for FDD RSRQ accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	40	40
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	C.3.5
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	R.0 FS3	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in D.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	OP.13 FDD	OP.14 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				

PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-	
	Bands FDD_B1, FDD_B2		-119		
	Bands FDD_C		-118.5		
	Bands FDD_D		-118		
	Bands FDD_E, FDD_F Note 6		-117.5		
	Bands FDD_G		-116.5		
	Bands FDD_H		-116		
	Bands FS3_G		-	[(N_{oc} for Channel 1 +3.5dB)]	
$\hat{E}_s/I_{ot}$		dB	-4	-5.54Note9	-5.16
RSRPNote3	Bands FDD_A	dBm/15 kHz	-123.5	-	
	Bands FDD_B1, FDD_B2		-123		
	Bands FDD_C		-122.5		
	Bands FDD_D		-122		
	Bands FDD_E, FDD_F Note 6		-121.5		
	Bands FDD_G		-120.5		
	Bands FDD_H		-120		
	Bands FS3_G		-	(RSRP for Cell 1 +3.8dB)	(RSRP for Cell 1 +3.8dB)
RSRQNote3	Bands FDD_A	dBm/15 kHz	-16.25	-	
	Bands FDD_B1, FDD_B2				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
	Bands FS3_G		-	-17.40Note9	-17.10
IoNote3	Bands FDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	-90.26 +10log($N_{RB,c}$/50)	-	
	Bands FDD_B1, FDD_B2		-89.76 +10log($N_{RB,c}$/50)		
	Bands FDD_C		-89.26 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-88.76 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-88.26 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-87.26 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-86.76 +10log($N_{RB,c}$/50)		
	Bands FS3_G		-	(Io for Channel 1 +4.59dBNote9)	(Io for Channel 1 +4.59dB)
$\hat{E}_s/N_{oc}$		dB	-4	-4	-3.7
Propagation condition		-	AWGN		
Note 1: OCNG shall be used such that cells are fully allocated and a constant total transmitted					

power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz

Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: The value is corresponding to DRS transmission through LBT operation in Cell3.

Note 10: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.2.51.5-2: RSRQ absolute accuracy requirements for the reported values for FDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.51.5-3: RSRQ relative accuracy requirements for the reported values for FDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell1 – 12
Highest reported value (Cell 3)		RSRQ_Cell 1 + 9
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 – 12
Highest reported value (Cell 3)		RSRQ_Cell 1 + 9

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.52 FS3 Intra frequency absolute and relative RSRQ accuracies with TDD PCell

9.2.52.1 Test purpose

The purpose of this test is to verify that the TDD intra frequency RSRQ absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRQ accuracy requirement of the secondary component carrier defined in clause 9.1.19.2 of TS 36.133. The test will also verify the primary and secondary component carrier relative RSRQ accuracy requirement defined in Clause 9.1.19.4 of TS 36.133.

9.2.52.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 13 and forward that support downlink LAAwith TDD as PCell.

9.2.52.3 Minimum conformance requirements

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on one SCC.

Absolute RSRQ measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.3.4 in TS 36.133.

The accuracy requirements in Table 9.2.52.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.2 of [4] for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.52.3-1: RSRQ intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FS3_G	-118	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.52.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex B.3.24.2 of [4] for a corresponding Band.

$$\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.52.3-1: RSRQ inter-frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FS3_G	-118	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.2.52.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.52.3-2: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE 2: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.19.2, 9.1.19.3 and A.9.2.52.

9.2.52.4 Test description

9.2.52.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.52.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.41 as appropriate for UE supporting only 2Rx RF bands on all CC and Annex A,

Figure A.X3 (without faders on active cells and without neighbour on Pcell) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.52.4.3.

4. Cell 1 is PCell in TDD on the primary component carrier, Cell 2 is SCell on SCC1 with frame structure 3, and Cell 3 is a neighbouring cell on the same CC as Cell2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.52.4.2 Test procedure

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier with frame structure 3 and activated, and Cell3 is the neighbouring cell on the same secondary component carrier of Cell2. The test parameters are given in Table 9.2.52.5-1. The DMTC configuration for Cell2 and Cell3 is provided to the UE in the *measDS-Config* before the start of the test in test procedure step 8.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.52.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.
   The reported RSRQ values for Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.52.5-2. This counts respectively as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 1, the number of failed iterations for the respective event "Cell 3" is increased by one.
   The reported RSRQ values for Cell3 are compared to the reported RSRQ value for other cells for each MeasurementReport message according to Table 9.2.52.5-3. These count respectively as a Pass or Fail for the event "Cell 1-3". If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 1-3”, is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If both events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.52.4.3-1: Common Exception messages for TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.52.4.3-2: *MeasDS-Config*: Additional Exception messages for TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirement

Derivation Path: 36.508, clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		LAA SCell
}			
measCSI-RS-ToRemoveList-r12	Not present		
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Config-r12 {			
	Not present		
}			
}			
}			

9.2.52.5 Test requirement

Table 9.2.52.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.52.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.52.5-3.

Table 9.2.52.5-1: Test parameters for TDD RSRQ accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	40	40
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	C.3.5
Special subframe configuration[Note1]		6	N/A	N/A
Uplink/downlink configuration[Note1]		1	N/A	N/A
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	R.0 FS3	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in D.2 and D.1		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	OP.13 FDD	OP.14 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				

PDSCH_RB					
OCNG_RA Note2					
OCNG_RB Note2					
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.5	-	
	Bands TDD_C		-118.5		
	Bands TDD_E		-117.5		
	Bands FS3_G		-	(N_{oc} for Channel 1 +3.5dB)	
$\hat{E}_s / I_{ot}$		dB	-4	-5.54Note9	-5.16
RSRPNote4	Bands TDD_A	dBm/15 kHz	-123.5	-	
	Bands TDD_C		-122.5		
	Bands TDD_E		-121.5		
	Bands FS3_G		-	(RSRP for Cell 1 +3.8dB)	(RSRP for Cell 1 +3.8dB)
RSRQNote4	Bands TDD_A	dBm/15 kHz	[-16.25]	-	
	Bands TDD_C				
	Bands TDD_E				
	Bands FS3_G		-	-17.40 Note9	-17.10
IoNote4	Bands TDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	-90.26 +10log($N_{RB,c}$/50)	-	
	Bands TDD_C		-89.26 +10log($N_{RB,c}$/50)		
	Bands TDD_E		-88.26 +10log($N_{RB,c}$/50)		
	Bands FS3_G		-	(Io for Channel 1 +4.59dBNote9)	(Io for Channel 1 +4.59dB)
$\hat{E}_s / N_{oc}$		dB	-4	-4	-3.7
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. For cells with LBT model, OCNG is transmitted only in subframes with downlink transmission bursts, and is not transmitted during muted subframes or during DMTC windows.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.2.52.5-2: RSRQ absolute accuracy requirements for the reported values for TDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.52.5-3: RSRQ relative accuracy requirements for the reported values for TDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 – 12
Highest reported value (Cell 3)		RSRQ_Cell1 + 9
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_Cell 1 – 12
Highest reported value (Cell 3)		RSRQ_Cell1 + 9

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.53 to 9.2.54 Void

9.2.55 3DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes

9.2.55.1 Test purpose

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.55.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 3DL CA.

Note on the applicability: If the generic duplex-mode test case 9.2.55 is tested with FDD PCell, the specific duplex-mode test cases 9.2.38 and 9.2.40 do not need to be tested. If the generic duplex-mode test case 9.2.22 is tested with TDD PCell, the specific duplex-mode test cases 9.2.39 and 9.2.41 do not need to be tested.

9.2.55.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.55.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.55.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.55.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.55.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.55.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.55.

9.2.55.4 Test description

9.2.55.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, and TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.55.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.55.4.3.

4. Cell 1 is PCell on channel 1, Cell 2 is SCell on SCC1, and Cell 3 is SCell on SCC2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3shall be powered OFF.

9.2.55.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2 and Cell 3) on the SCCs as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.55.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

The reported RSRQ values for Cell 1, Cell 2, and Cell 3are compared to the actual RSRQ values according to Table 9.2.55.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, and “Cell 3”. If the UE fails to report the measurement value for Cell 1, Cell 2, or Cell 3, the number of failed iterations for the respective event is increased by one.

The reported RSRQ values for Cell 2, and Cell 3 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.55.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, and “Cell 1-3”. If the UE fails to report the measurement value for Cell 2, and Cell 3, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 1-2”, and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.55.4.3-1: Common Exception messages for 3DL RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.55.5 Test requirement

Table 9.2.55.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.55.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.55.5-3.

Table 9.2.55.5-1: 3 DL RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2 and Cell #3)

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number		1	2	3
Duplex mode		FDD or TDD	FDD or TDD	FDD or TDD
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
TDD Special subframe configuration[Note1]		6	6	6
TDD Uplink/downlink configuration[Note1]		1	1	1
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1		5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD
OCNG Patterns defined in Annex D		5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				

PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note2					
OCNG_RB Note2					
N_{oc} Note3	Bands TDD_A	dBm/ 15kHz	-119.2	-116	-116
	Bands TDD_C		-118.2	-115	-115
	Bands TDD_E		-117.2	-114	-114
	Bands FDD_A		-119.2	-116	-116
	Bands FDD_B1, FDD_B2 Note 11		-118.7	-115.5	-115.5
	Bands FDD_C		-118.2	-115	-115
	Bands FDD_D		-117.7	-114.5	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-114	-114
	Bands FDD_G		-116.2	-113	-113
	Bands FDD_H		-115.7	-112.5	-112.5
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/ 15kHz	-124.4	-121.2	-121.2
	Bands TDD_C		-123.4	-120.2	-120.2
	Bands TDD_E		-122.4	-119.2	-119.2
	Bands FDD_A		-124.4	-121.2	-121.2
	Bands FDD_B1, FDD_B2 Note 11		-123.9	-120.7	-120.7
	Bands FDD_C		-123.4	-120.2	-120.2
	Bands FDD_D		-122.9	-119.7	-119.7
	Bands FDD_E, Bands FDD_F Note 6		-121.4	-119.2	-119.2
	Bands FDD_G		-121.4	-118.2	-118.2
	Bands FDD_H		-120.9	-117.7	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-17.14	-17.14
	Bands TDD_C				
	Bands TDD_E				
	Bands FDD_A		-17.14	-17.14	-17.14
	Bands FDD_B1, FDD_B2 Note 11				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, Bands FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-90.27 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)
	Bands TDD_C		-89.27 + 10log($N_{RB,c}$/50)	-86.07 + 10log($N_{RB,c}$/50)	-86.07 + 10log($N_{RB,c}$/50)
	Bands TDD_E		-88.27 + 10log($N_{RB,c}$/50)	-85.07 + 10log($N_{RB,c}$/50)	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_A		-90.27 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)
	Bands FDD_B1, FDD_B2 Note 11		-89.77 + 10log($N_{RB,c}$/50)	-86.57 + 10log($N_{RB,c}$/50)	-86.57 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-89.27 +	-86.07 +	-86.07 +

			$10\log(N_{RB,c}/50)$	$10\log(N_{RB,c}/50)$	$10\log(N_{RB,c}/50)$
	Bands FDD_D		$-88.77 + 10\log(N_{RB,c}/50)$	$-85.57 + 10\log(N_{RB,c}/50)$	$-85.57 + 10\log(N_{RB,c}/50)$
	Bands FDD_E, Bands FDD_F Note 6		$-88.27 + 10\log(N_{RB,c}/50)$	$-85.07 + 10\log(N_{RB,c}/50)$	$-85.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_G		$-87.27 + 10\log(N_{RB,c}/50)$	$-84.07 + 10\log(N_{RB,c}/50)$	$-84.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_H		$-86.77 + 10\log(N_{RB,c}/50)$	$-83.57 + 10\log(N_{RB,c}/50)$	$-83.57 + 10\log(N_{RB,c}/50)$
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 11: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.2.55.5-2: RSRQ absolute accuracy requirements for the reported values for 3 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.55.5-3: RSRQ relative accuracy requirements for the reported values for 3 DL for E-UTRAN in Carrier Aggregation

	Event	All bands

Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.56 4 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes

9.2.56.1 Test purpose

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.56.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL CA.

This test case also applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD, TDD and 4DL CA.

Note on the applicability: If the generic duplex-mode test case 9.2.56 is tested with FDD PCell, the specific duplex-mode test case 9.2.45 does not need to be tested. If the generic duplex-mode test case 9.2.56 is tested with TDD PCell, the specific duplex-mode test case 9.2.46 does not need to be tested.

9.2.56.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.56.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.56.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io [Note 1] range		
			E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 3]	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.56.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
  - Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
  - RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
  - $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
  - | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.56.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot [Note 2]	Io [Note 1] range		
			E-UTRA operating band groups [Note 5]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 4]	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.56.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.56.

9.2.56.4 Test description

9.2.56.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-5 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.56.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as follows:

   - For UEs supporting only 2Rx in all the bands under test, use TS 36.508 [7] Annex A, Figure group A.63 as appropriate.

   - For UEs supporting 4Rx in any of the bands under test use TS 36.508 [7] Annex A, Figure A.90, without neighbour on Pcell. Use the 2Rx module for cells on bands supporting 2Rx and the 4Rx module for cells on bands supporting 4Rx.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.56.4.3.

4. Cell 1 is PCell on channel 1, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, and Cell 4 is SCell on SCC3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 shall be powered OFF.

9.2.56.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 3, and Cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.56.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

The reported RSRQ values for Cell 1, Cell 2, Cell 3, and Cell 4 are compared to the actual RSRQ values according to Table 9.2.56.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 3”, and “Cell 4”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, or Cell 4, the number of failed iterations for the respective event is increased by one.

The reported RSRQ values for Cell 2, Cell 3 and Cell 4 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.56.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-3”, and “Cell 1-4”. If the UE fails to report the measurement value for Cell 2, Cell 3, or Cell 4, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 1-2”, “Cell 1-3”, and “Cell 1-4” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.56.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.56.4.3-1: Common Exception messages for 4DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.56.5 Test requirement

Table 9.2.56.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.56.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.56.5-3.

Table 9.2.56.5-1: 4 DL RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3 and Cell #4)

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4
E-UTRA RF Channel Number		1	2	3	4
Duplex Mode		FDD or TDD	FDD or TDD	FDD or TDD	FDD or TDD
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]		FDD: - TDD: 6	FDD: - TDD: 6	FDD: - TDD: 6	FDD: - TDD: 6
Uplink/downlink configuration[Note1]		FDD: - TDD: 1	FDD: - TDD: 1	FDD: - TDD: 1	FDD: - TDD: 1
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1		For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2		For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					

N_{oc} Note3	Bands TDD_A	dBm/ 15kHz	-116	-116	-116	-116
	Bands TDD_C		-115	-115	-115	-115
	Bands TDD_E		-114	-114	-114	-114
	Bands FDD_A		-119.2	-119.2	-119.2	-119.2
	Bands FDD_B1, FDD_B2		-118.7	-118.7	-118.7	-118.7
	Bands FDD_C		-118.2	-118.2	-118.2	-118.2
	Bands FDD_D		-117.7	-117.7	-117.7	-117.7
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-117.2	-117.2	-117.2
	Bands FDD_G		-116.2	-116.2	-116.2	-116.2
	Bands FDD_H		-115.7	-115.7	-115.7	-115.7
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2	-5.2	-5.2
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/ 15kHz	-121.2	-121.2	-121.2	-121.2
	Bands TDD_C		-120.2	-120.2	-120.2	-120.2
	Bands TDD_E		-119.2	-119.2	-119.2	-119.2
	Bands FDD_A		-124.4	-124.4	-124.4	-124.4
	Bands FDD_B1, FDD_B2		-123.9	-123.9	-123.9	-123.9
	Bands FDD_C		-123.4	-123.4	-123.4	-123.4
	Bands FDD_D		-122.9	-122.9	-122.9	-122.9
	Bands FDD_E, Bands FDD_F Note 6		-122.4	-122.4	-122.4	-122.4
	Bands FDD_G		-121.4	-121.4	-121.4	-121.4
	Bands FDD_H		-120.9	-120.9	-120.9	-120.9
RSRQ Note4	Bands TDD_A	dB	-17.14	-17.14	-17.14	-17.14
	Bands TDD_C					
	Bands TDD_E					
	Bands FDD_A		-17.14	-17.14	-17.14	-17.14
	Bands FDD_B1, FDD_B2					
	Bands FDD_C					
	Bands FDD_D					
	Bands FDD_E,					

	Bands FDD_F Note 6					
	Bands FDD_G					
	Bands FDD_H					
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-87. 07 + 10log(NRB,c/50)	-87.07 + 10log(NRB,c/50)	-87.07 + 10log(NRB,c/50)	-87.07 + 10log(NRB,c/50)
	Bands TDD_C		-86. 07+ 10log(NRB,c/50)	-86.07 + 10log(NRB,c/50)	-86.07 + 10log(NRB,c/50)	-86.07 + 10log(NRB,c/50)
	Bands TDD_E		-85. 07 + 10log(NRB,c/50)	-85.07 + 10log(NRB,c/50)	-85.07 + 10log(NRB,c/50)	-85.07 + 10log(NRB,c/50)
	Bands FDD_A		-90. 27 + 10log(NRB,c/50)	-90.27 + 10log(NRB,c/50)	-90.27 + 10log(NRB,c/50)	-90.27 + 10log(NRB,c/50)
	Bands FDD_B1, FDD_B2		-89.77 + 10log(NRB,c/50)	-89.77 + 10log(NRB,c/50)	-89.77 + 10log(NRB,c/50)	-89.77 + 10log(NRB,c/50)
	Bands FDD_C		-89.27 + 10log(NRB,c/50)	-89.27 + 10log(NRB,c/50)	-89.27 + 10log(NRB,c/50)	-89.27 + 10log(NRB,c/50)
	Bands FDD_D		-88.77 + 10log(NRB,c/50)	-88.77 + 10log(NRB,c/50)	-88.77 + 10log(NRB,c/50)	-88.77 + 10log(NRB,c/50)
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + 10log(NRB,c/50)	-88.27 + 10log(NRB,c/50)	-88.27 + 10log(NRB,c/50)	-88.27 + 10log(NRB,c/50)
	Bands FDD_G		-87. 27 + 10log(NRB,c/50)	-87.27 + 10log(NRB,c/50)	-87.27 + 10log(NRB,c/50)	-87.27 + 10log(NRB,c/50)
	Bands FDD_H		-86.77 + 10log(NRB,c/50)	-86.77 + 10log(NRB,c/50)	-86.77 + 10log(NRB,c/50)	-86.77 + 10log(NRB,c/50)
Propagation Condition			AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10			-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.56.5-2: RSRQ absolute accuracy requirements for the reported values for 4 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_15

Table 9.2.56.5-3: RSRQ relative accuracy requirements for the reported values for 4 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.57 5 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes

9.2.57.1 Test purpose

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.57.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 5DL CA.

This test also applies to all types of E-UTRA UE Release 12 and forward that support E-UTRA FDD, E-UTRA TDD and 5DL CA.

Note on the applicability: If the generic duplex-mode test case 9.2.57 is tested with FDD PCell, the specific duplex-mode test case 9.2.47 does not need to be tested. If the generic duplex-mode test case 9.2.56 is tested with TDD PCell, the specific duplex-mode test case 9.2.48 does not need to be tested.

9.2.57.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.57.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.57.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.57.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
  - Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
  - RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band

- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$

- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.57.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.57.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.57.

9.2.57.4 Test description

9.2.57.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.57.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.57.4.3.
4. Cell 1 is PCell in channel 1 on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, Cell 4 is SCell on SCC3 and Cell 5 is SCell on SCC4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, and Cell 5 shall be powered OFF.

9.2.57.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, and Cell 5) on the SCCs as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.57.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2, Cell 3, Cell 4, and Cell 5 are compared to the actual RSRQ values according to Table 9.2.57.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, and “Cell 5”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2, Cell 3, Cell 4, and Cell 5 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.57.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, and “Cell 1-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.
10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

    Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 5”, “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, and “Cell 1-5” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.57.4.3-1: Common Exception messages for 5DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.57.5 Test requirement

Table 9.2.57.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.57.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.57.5-3.

Table 9.2.57.5-1: 5DL RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3, Cell #4, and Cell #5)

Parameter		Unit	Cell 1	Cells			
				2	3	4	5
E-UTRA RF Channel Number			1	2	3	4	5
Duplex Mode			FDD or TDD	FDD or TDD			
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
Special subframe configuration[Note1]			FDD: - TDD: 6	FDD: - TDD: 6			
Uplink/downlink configuration[Note1]			FDD: - TDD: 1	FDD: - TDD: 1			
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52			
PDSCH Reference measurement channel defined in A.3.1.1			For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	For FDD: 5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD For TDD: 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61			
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	For FDD: 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD For TDD: 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Patterns defined in A.3.2			For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	For FDD: 5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD For TDD: 5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			
PBCH_RA		dB	0	0			
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA[Note2]							
OCNG_RB[Note2]							
N_{oc} [Note3]	Bands TDD_A	dBm/ 15kHz	-116	-116			
	Bands TDD_C		-115	-115			
	Bands TDD_E		-114	-114			
	Bands FDD_A		-119.2	-119.2			
	Bands FDD_B1, FDD_B2		-118.7	-118.7			
	Bands FDD_C		-118.2	-118.2			
	Bands FDD_D		-117.7	-117.7			
	Bands		-117.2	-117.2			

	FDD_E, Bands FDD_F Note 6						
	Bands FDD_G		-116.2	-116.2			
	Bands FDD_H		-115.7	-115.7			
$\hat{E}_s / N_{oc}$		dB	-5.2	-5.2			
$\hat{E}_s / I_{ot}$		dB	-5.2	-5.2			
RSRP Note4	Bands TDD_A	dBm/ 15kHz	-121.2	-121.2			
	Bands TDD_C		-120.2	-120.2			
	Bands TDD_E		-119.2	-119.2			
	Bands FDD_A		-124.4	-124.4			
	Bands FDD_B1, FDD_B2		-123.9	-123.9			
	Bands FDD_C		-123.4	-123.4			
	Bands FDD_D		-122.9	-122.9			
	Bands FDD_E, Bands FDD_F Note 6		-122.4	-122.4			
	Bands FDD_G		-121.4	-121.4			
	Bands FDD_H		-120.9	-120.9			
RSRQ Note4	Bands TDD_A	dB	-17.14	-17.14			
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-17.14	-17.14			
	Bands FDD_B1, FDD_B2						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, Bands FDD_F Note 6						
	Bands FDD_G						
	Bands FDD_H						
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-87.07 + 10log(NRB,c/50)	-87.07 + 10log(NRB,c/50)			
	Bands TDD_C		-86.07 + 10log(NRB,c/50)	-86.07 + 10log(NRB,c/50)			
	Bands TDD_E		-85.07 + 10log(NRB,c/50)	-85.07 + 10log(NRB,c/50)			
	Bands FDD_A		-90.27 + 10log(NRB,c/50)	-90.27 + 10log(NRB,c/50)			
	Bands FDD_B1, FDD_B2		-89.77 + 10log(NRB,c/50)	-89.77 + 10log(NRB,c/50)			
	Bands FDD_C		-89.27 + 10log(NRB,c/50)	-89.27 + 10log(NRB,c/50)			
	Bands FDD_D		-88.77 + 10log(NRB,c/50)	-88.77 + 10log(NRB,c/50)			
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + 10log(NRB,c/50)	-88.27 + 10log(NRB,c/50)			
	Bands FDD_G		-87.27 + 10log(NRB,c/50)	-87.27 + 10log(NRB,c/50)			
	Bands FDD_H		-86.77 + 10log(NRB,c/50)	-86.77 + 10log(NRB,c/50)			
Propagation Condition			AWGN	AWGN			
Antenna Configuration			1x2	1x2			
Timing offset to Cell 1		μs	-	0			
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE	≤ TAE

Time alignment error relative to cell 2 Note 10		-	-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10		-	-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 4 Note 10		-	-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.57.5-2: RSRQ absolute accuracy requirements for the reported values for 5 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14RSRQ_XX
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_14
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_15
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_15

Table 9.2.57.5-3: RSRQ relative accuracy requirements for the reported values for 5 DL for E-UTRAN in Carrier Aggregation

	Event	All bands

Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.58 6 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Applicability needs to be added to TS 36.521-2

9.2.58.1 Test purpose

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.58.2 Test applicability

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.58.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.58.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$

- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.58.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.58.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.58.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.58.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.58.

9.2.58.4 Test description

9.2.58.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.58.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] AnnexA, Figure group A.63 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.58.4.3.

4. Cell 1 is PCell in channel 1 on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, Cell 4 is SCell on SCC3, Cell 5 is SCell on SCC4 and Cell 6 is SCell on SCC5. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 shall be powered OFF.

9.2.58.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6) on the SCCs as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.58.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.
   The reported RSRQ values for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 are compared to the actual RSRQ values according to Table 9.2.58.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 5 and “Cell 6”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5 or Cell 6, the number of failed iterations for the respective event is increased by one.
   The reported RSRQ values for Cell 2, Cell 3, Cell 4, Cell 5 and Cell 6 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.58.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, “Cell 1-5” and “Cell 1-6”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5 or Cell 6, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
    Each of the events "Cell 1", "Cell 2", "Cell 3", "Cell 4", "Cell 5", "Cell 1-2", "Cell 1-3", "Cell 1-4", "Cell 1-5" and "Cell 1-6" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.58.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.58.4.3-1: Common Exception messages for 6DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.58.5 Test requirement

Table 9.2.58.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.58.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.58.5-3.

Table 9.2.58.5-1: 6DL RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3, Cell #4, Cell #5 and Cell #6)

Parameter	Unit	Cell 1	Cells				
			2	3	4	5	6
E-UTRA RF Channel Number		1	2	3	4	5	6
Duplex mode		FDD or TDD	FDD or TDD				
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
TDD Special subframe configuration[Note1]		-	6				
TDD uplink/downlink configuration[Note1]		-	1				
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52				
PDSCH Reference measurement channel defined in A.3.1.1		5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD				
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61				
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD				
OCNG Patterns defined in A.3.2		5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD				
PBCH_RA	dB	0	0				
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							

PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/ 15kHz	-116	-116
	Bands TDD_C		-115	-115
	Bands TDD_E		-114	-114
	Bands FDD_A		-119.5	-119.5
	Bands FDD_B1, FDD_B2 Note 11		-119	-119
	Bands FDD_C		-118.5	-118.5
	Bands FDD_D		-118	-118
	Bands FDD_E, Bands FDD_F Note 6		-117.5	-117.5
	Bands FDD_G		-116.5	-116.5
	Bands FDD_H		-116	-116
$\hat{E}_s / N_{oc}$		dB	-6.0	-6.0
$\hat{E}_s / I_{ot}$		dB	-6.0	-6.0
RSRP Note4	Bands TDD_A	dBm/ 15kHz	-122	-122
	Bands TDD_C		-121	-121
	Bands TDD_E		-120	-120
	Bands FDD_A		-125.5	-125.5
	Bands FDD_B, FDD_B2 Note 11		-125	-125
	Bands FDD_C		-124.5	-124.5
	Bands FDD_D		-124	-124
	Bands FDD_E, Bands FDD_F Note 6		-123.5	-123.5
	Bands FDD_G		-122.5	-122.5
	Bands FDD_H		-122	-122
RSRQ Note4	Bands TDD_A	dB	-17.77	-17.77
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.77	-17.77
	Bands FDD_B, FDD_B2 Note 11			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-87.25 + 10log($N_{RB,c}$/50)	-87.25 + 10log($N_{RB,c}$/50)
	Bands TDD_C		-86.25 + 10log($N_{RB,c}$/50)	-86.25 + 10log($N_{RB,c}$/50)
	Bands TDD_E		-85.25 + 10log($N_{RB,c}$/50)	-85.25 + 10log($N_{RB,c}$/50)
	Bands FDD_A		-90.75 + 10log($N_{RB,c}$/50)	-90.75 + 10log($N_{RB,c}$/50)
	Bands FDD_B, FDD_B2 Note 11		-90.25 + 10log($N_{RB,c}$/50)	-90.25 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-89.75 +	-89.75 + 10log($N_{RB,c}$/50)

			$10\log(N_{RB,c}/50)$					
	Bands FDD_D		$-89.25 + 10\log(N_{RB,c}/50)$	$-89.25 + 10\log(N_{RB,c}/50)$				
	Bands FDD_E, Bands FDD_F Note 6		$-88.75 + 10\log(N_{RB,c}/50)$	$-88.75 + 10\log(N_{RB,c}/50)$				
	Bands FDD_G		$-87.75 + 10\log(N_{RB,c}/50)$	$-87.75 + 10\log(N_{RB,c}/50)$				
	Bands FDD_H		$-87.25 + 10\log(N_{RB,c}/50)$	$-87.25 + 10\log(N_{RB,c}/50)$				
Propagation Condition			AWGN	AWGN				
Antenna Configuration			1x2	1x2				
Timing offset to Cell 1		µs	-	0				
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10			-	-	-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 4 Note 10			-	-	-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 5 Note 10			-	-	-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: Void
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 11: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.2.58.5-2: RSRQ absolute accuracy requirements for the reported values for 6 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14RSRQ_XX
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_14
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_14
Lowest reported value (Cell 6)	Cell 6	RSRQ_00
Highest reported value (Cell 6)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_15
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_15
Lowest reported value (Cell 6)	Cell 6	RSRQ_00
Highest reported value (Cell 6)		RSRQ_15

Table 9.2.58.5-3: RSRQ relative accuracy requirements for the reported values for 6 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-6	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Lowest reported value (Cell 6)	Cell 1-6	RSRQ_x - 10
Highest reported value (Cell 6)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.59 7 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Applicability needs to be added to TS 36.521-2

9.2.59.1 Test purpose

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.59.2 Test applicability

To verify that RSRQ absolute and relative measurement accuracy in carrier aggregation are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.59.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.59.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.59.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.59.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left|RSRP1\right|_{dBm} - RSRP2\left|_{dBm}\right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.59.3-2: RSRQ Inter frequency relative accuracy

Accuracy		**Conditions**			
Normal condition	**Extreme condition**	**Ês/Iot** Note 2	**Io** Note 1 **range**		
			E-UTRA operating band groups Note 5	**Minimum Io**	**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz** Note 4	**dBm/BW$_{Channel}$**
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B1, FDD_B2	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.59.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.59

9.2.59.4 Test description

9.2.59.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-6 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.59.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] AnnexA, Figure group A.63 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.59.4.3.
4. Cell 1 is PCell in channel 1 on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, Cell 4 is SCell on SCC3, Cell 5 is SCell on SCC4, Cell 6 is SCell on SCC5 and Cell 7 is SCell on SCC6. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7shall be powered OFF.

9.2.59.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7) on the SCCs as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.59.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7are compared to the actual RSRQ values according to Table 9.2.59.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 5, “Cell 6” and “Cell 7”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 or Cell 7, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.59.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, “Cell 1-5”, “Cell 1-6” and “Cell 1-7”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 or Cell 7, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

    Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 5”, “Cell 6”, “Cell 7”, “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, “Cell 1-5”, “Cell 1-6” and “Cell 1-7”is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.59.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.59.4.3-1: Common Exception messages for 7DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.59.5 Test requirement

Table 9.2.59.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.59.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.59.5-3.

Table 9.2.59.5-1: 7DL RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3, Cell #4, Cell #5, Cell #6 and Cell #7)

Parameter	Unit	Cell 1	Cells					
			2	3	4	5	6	7

E-UTRA RF Channel Number		1	2	3	4	5	6	7
Duplex mode		FDD or TDD	FDD or TDD					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
TDD Special subframe configuration[Note1]		-	6					
TDD uplink/downlink configuration[Note1]		-	1					
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52					
PDSCH Reference measurement channel defined in A.3.1.1		5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD	5MHz FDD: R.5 FDD 10MHz FDD: R.0 FDD 20MHz FDD: R.4 FDD 5MHz TDD: R.4 TDD 10MHz TDD: R.0 TDD 20MHz TDD: R.3 TDD					
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61					
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD	5MHz FDD: R.11 FDD 10MHz FDD: R.6 FDD 20MHz FDD: R.10 FDD 5MHz TDD: R.11 TDD 10MHz TDD: R.6 TDD 20MHz TDD: R.10 TDD					
OCNG Patterns defined in A.3.2		5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD	5MHz FDD: OP.15 FDD 10MHz FDD: OP.1 FDD 20MHz FDD: OP.11 FDD 5MHz TDD: OP.9 TDD 10MHz TDD: OP.1 TDD 20MHz TDD: OP.7 TDD					
PBCH_RA	dB	0	0					
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								

OCNG_RB[Note2]				
N_{oc} [Note3]	Bands TDD_A	dBm/ 15kHz	-116	-116
	Bands TDD_C		-115	-115
	Bands TDD_E		-114	-114
	Bands FDD_A		-119.5	-119.5
	Bands FDD_B1, FDD_B2 [Note 11]		-119	-119
	Bands FDD_C		-118.5	-118.5
	Bands FDD_D		-118	-118
	Bands FDD_E, Bands FDD_F [Note 6]		-117.5	-117.5
	Bands FDD_G		-116.5	-116.5
	Bands FDD_H		-116	-116
$\hat{E}_s / N_{oc}$		dB	-6.0	-6.0
$\hat{E}_s / I_{ot}$		dB	-6.0	-6.0
RSRP[Note4]	Bands TDD_A	dBm/ 15kHz	-122	-122
	Bands TDD_C		-121	-121
	Bands TDD_E		-120	-120
	Bands FDD_A		-125.5	-125.5
	Bands FDD_B, FDD_B2 [Note 11]		-125	-125
	Bands FDD_C		-124.5	-124.5
	Bands FDD_D		-124	-124
	Bands FDD_E, Bands FDD_F [Note 6]		-123.5	-123.5
	Bands FDD_G		-122.5	-122.5
	Bands FDD_H		-122	-122
RSRQ[Note4]	Bands TDD_A	dB	-17.77	-17.77
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.77	-17.77
	Bands FDD_B, FDD_B2 [Note 11]			
	Bands FDD_C			

	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io^{Note4}	Bands TDD_A	dBm/ $BW_{channel}$	-87.25 + 10log($N_{RB,c}$/50)	-87.25 + 10log($N_{RB,c}$/50)
	Bands TDD_C		-86.25 + 10log($N_{RB,c}$/50)	-86.25 + 10log($N_{RB,c}$/50)
	Bands TDD_E		-85.25 + 10log($N_{RB,c}$/50)	-85.25 + 10log($N_{RB,c}$/50)
	Bands FDD_A		-90.75 + 10log($N_{RB,c}$/50)	-90.75 + 10log($N_{RB,c}$/50)
	Bands FDD_B, FDD_B2 Note 11		-90.25 + 10log($N_{RB,c}$/50)	-90.25 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-89.75 + 10log($N_{RB,c}$/50)	-89.75 + 10log($N_{RB,c}$/50)
	Bands FDD_D		-89.25 + 10log($N_{RB,c}$/50)	-89.25 + 10log($N_{RB,c}$/50)
	Bands FDD_E, Bands FDD_F Note 6		-88.75 + 10log($N_{RB,c}$/50)	-88.75 + 10log($N_{RB,c}$/50)
	Bands FDD_G		-87.75 + 10log($N_{RB,c}$/50)	-87.75 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-87.25 + 10log($N_{RB,c}$/50)	-87.25 + 10log($N_{RB,c}$/50)

Propagation Condition		AWGN	AWGN					
Antenna Configuration		1x2	1x2					
Timing offset to Cell 1	μs	-	0					
Time alignment error relative to cell 1 Note 10		-	≤ TAE	≤ TAE	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10		-	-	≤ TAE	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10		-	-	-	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 4 Note 10		-	-	-	-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 5 Note 10		-	-	-	-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 6 Note 10		-	-	-	-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: Void
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 11: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz.

Table 9.2.59.5-2: RSRQ absolute accuracy requirements for the reported values for 7 DL for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14RSRQ_XX
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_14
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_14
Lowest reported value (Cell 6)	Cell 6	RSRQ_00
Highest reported value (Cell 6)		RSRQ_14
Lowest reported value (Cell 7)	Cell 7	RSRQ_00
Highest reported value (Cell 7)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15
Lowest reported value (Cell 4)	Cell 4	RSRQ_00
Highest reported value (Cell 4)		RSRQ_15
Lowest reported value (Cell 5)	Cell 5	RSRQ_00
Highest reported value (Cell 5)		RSRQ_15
Lowest reported value (Cell 6)	Cell 6	RSRQ_00
Highest reported value (Cell 6)		RSRQ_15
Lowest reported value (Cell 7)	Cell 7	RSRQ_00
Highest reported value (Cell 7)		RSRQ_15

Table 9.2.59.5-3: RSRQ relative accuracy requirements for the reported values for 7 DL for E-UTRAN in Carrier Aggregation

	Event	All bands

Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Lowest reported value (Cell 6)	Cell 1-6	RSRQ_x - 10
Highest reported value (Cell 6)		RSRQ_x + 10
Lowest reported value (Cell 7)	Cell 1-7	RSRQ_x - 10
Highest reported value (Cell 7)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x - 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x - 10
Highest reported value (Cell 3)		RSRQ_x + 10
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x - 10
Highest reported value (Cell 4)		RSRQ_x + 10
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x - 10
Highest reported value (Cell 5)		RSRQ_x + 10
Lowest reported value (Cell 6)	Cell 1-6	RSRQ_x - 10
Highest reported value (Cell 6)		RSRQ_x + 10
Lowest reported value (Cell 7)	Cell 1-7	RSRQ_x - 10
Highest reported value (Cell 7)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.3 UTRA FDD CPICH RSCP

9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy

9.3.1.1 Test purpose

To verify that the CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.3.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.1.3-1.

Table 9.3.1.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50

NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.1.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.1.

9.3.1.4 Test description

9.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.1.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.1.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.3.1.5-1 and 9.3.1.5-2 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit a RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit a RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.3.1.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Set the parameters according to Tables 9.3.1.5-1 and 9.3.1.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.3.1.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.1.4.3-2: *MeasResults*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.1.4.3-3: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

Table 9.3.1.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigUTRA SEQUENCE {			
measQuantityUTRA-FDD	cpich-RSCP		
filterCoefficient	fc0		
}			

9.3.1.5 Test requirement

The test parameters are given in Tables 9.3.1.4.1-1, 9.3.1.5-1 and 9.3.1.5-2 as below. Table 9.3.1.5-2 and 9.3.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.3.1.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	

PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s / I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s / N_{oc}$	dB	4
Propagation Condition		AWGN

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.3.1.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter		Unit	Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12
SCH_Ec/Ior		dB	-12	-12
PICH_Ec/Ior		dB	-15	-15
DPCH_Ec/Ior		dB	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-60.75	-93.76
	Band II, V, VII			-91.76
	Band XXV, XXVI			-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII			-90.76
	Band IX (Note 2)			-92.76
Îor/Ioc		dB	9.54	-9.19
CPICH RSCP, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm	-61.21	-112.95
	Band II, V, VII			-110.95
	Band XXV, XXVI			-109.45 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII			-109.95
	Band IX (Note 2)			-111.95
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-50.75	-93.27
	Band II, V, VII			-91.27
	Band XXV, XXVI			-89.77 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII			-90.27
	Band IX (Note 2)			-92.27
Propagation condition		-	AWGN	AWGN
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.				
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.				
NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.				
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.				

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.1.5-3.

Table 9.3.1.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2				
	All bands	Band I, IV, VI, X, XI, XIX, XXI	Band II, V, VII	Band XXV, XXVI (Note 2)	Band III, VIII, XII, XIII, XIV, XX, XXII	Band IX (Note 1)
Normal Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_46	CPICH_RSCP_-04	CPICH_RSCP_-02	CPICH_RSCP_-01	CPICH_RSCP_-01	CPICH_RSCP_-03
Highest reported value (Cell 2)	CPICH_RSCP_63	CPICH_RSCP_9	CPICH_RSCP_11	CPICH_RSCP_13	CPICH_RSCP_12	CPICH_RSCP_10
Extreme Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_43	CPICH_RSCP_-05	CPICH_RSCP_-05	CPICH_RSCP_-04	CPICH_RSCP_-04	CPICH_RSCP_-05
Highest reported value (Cell 2)	CPICH_RSCP_66	CPICH_RSCP_12	CPICH_RSCP_14	CPICH_RSCP_16	CPICH_RSCP_15	CPICH_RSCP_13

NOTE 1: For a multiband UE supporting both Band III and Band IX, for Band IX apply the test requirements of Band III. (Reference Table 9.3.1.5-2, Note 2).
NOTE 2: For a multiband UE supporting both Band V and Band XXVI, for Band XXVI when the carrier frequency of the assigned UTRA channel in is within 869-894 MHz apply the test requirements of Band V. (Reference Table 9.3.1.5-2, Note 3).

9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy

9.3.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.3.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.2.3-1.

Table 9.3.2.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50

NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.2.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.2.

9.3.2.4 Test description

9.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.2.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.3.2.5-1 and 9.3.2.5-2 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.3.2.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Set the parameters according to Tables 9.3.2.5-1and 9.3.2.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.3.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-RSCP	According to specific test		
}			
}			

9.3.2.5 Test requirement

The test parameters are given in Tables 9.3.2.4.1-1, 9.3.2.5-1 and 9.3.2.5-2 as below. Table 9.3.2.5-2 and 9.3.2.5-3 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.2.5-3.

Table 9.3.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration Note1		6	
Uplink-downlink configuration Note1		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 2	dB		
OCNG_RB Note 2	dB		
N_{oc} Note 3	dBm/15 kHz	-98	
RSRP Note 4	dBm/15 kHz	-94	
$\hat{E}_s / I_{ot}$	dB	4	
SCH_RP Note 4	dBm/15 kHz	-94	
$\hat{E}_s / N_{oc}$	dB	4	
Propagation Condition		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.3.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12
SCH_Ec/Ior		dB	-12	-12
PICH_Ec/Ior		dB	-15	-15
DPCH_Ec/Ior		dB	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-60.75	-93.76
	Band II, V, VII			-91.76
	Band XXV, XXVI			-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-90.76
	Band IX (Note 2)			-92.76
Îor/Ioc		dB	9.54	-9.19
CPICH RSCP, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm	-61.21	-112.95
	Band II, V, VII			-110.95
	Band XXV, XXVI			-109.45 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-109.95
	Band IX (Note 2)			-111.95
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-50.75	-93.27
	Band II, V, VII			-91.27
	Band XXV, XXVI			-89.77 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-90.27
	Band IX (Note 2)			-92.27
Propagation condition		-	AWGN	AWGN
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE. NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.				
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.				

Table 9.3.2.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2				
	All bands	Band I, IV, VI, X, XI, XIX, XXI	Band II, V, VII	Band XXV, XXVI	Band III, VIII, XII, XIII, XIV, XX, XXII	Band IX
Normal Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_46	CPICH_RSCP_-04	CPICH_RSCP_-02	CPICH_RSCP_-01	CPICH_RSCP_-01	CPICH_RSCP_-03
Highest reported value (Cell 2)	CPICH_RSCP_63	CPICH_RSCP_9	CPICH_RSCP_11	CPICH_RSCP_13	CPICH_RSCP_12	CPICH_RSCP_10
Extreme Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_43	CPICH_RSCP_-05	CPICH_RSCP_-05	CPICH_RSCP_-04	CPICH_RSCP_-04	CPICH_RSCP_-05
Highest reported value (Cell 2)	CPICH_RSCP_66	CPICH_RSCP_12	CPICH_RSCP_14	CPICH_RSCP_16	CPICH_RSCP_15	CPICH_RSCP_13

9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth

9.3.3.1 Test purpose

To verify that the CPICH RSCP absolute measurement accuracy is within the specified limits for bands within band group FDD_N.

9.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support E-UTRA bands within band group FDD_N and UTRA FDD.

9.3.3.3 Minimum conformance requirements

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in TS 36.133 [4] clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in TS 36.133 [4] table 9.3.3.3-1, under the following conditions:

- CPICH Ec/Io condition for a detectable cell is as specified in TS 36.133 [4] clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8;

- SCH_Ec/Io condition for a detectable cell is as specified in TS 36.133 [4] clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8.

Table 9.3.3.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50

NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the relevant UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.3.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.3.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clause 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.3.

9.3.3.4 Test description

9.3.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.3.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.3.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 9.3.1.4.1-1 for other general test parameters.			

9.3.3.4.2 Test procedure

Same test procedure as defined in clause 9.3.1.4.2 with the following exceptions:

- Instead of Table 9.3.1.5-1 → use Table 9.3.3.5-1.

9.3.3.4.3 Message contents

Same message contents as defined in clause 9.3.1.4.3.

9.3.3.5 Test requirement

The test parameters are given in Tables 9.3.3.4.1-1, 9.3.3.5-1 and 9.3.1.5-2 as below. Table 9.3.1.5-2 and 9.3.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.3.3.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter		Unit	Test 1	Test 2
E-UTRAN RF Channel Number			1	
$BW_{channel}$		MHz	5	
OCNG Patterns defined in D.1.15 (OP.15 FDD)			OP.15 FDD	
PBCH_RA		dB	0	
PBCH_RB		dB		
PSS_RA		dB		
SSS_RA		dB		
PCFICH_RB		dB		
PHICH_RA		dB		
PHICH_RB		dB		
PDCCH_RA		dB		
PDCCH_RB		dB		
PDSCH_RA		dB		
PDSCH_RB		dB		
OCNG_RA Note 1		dB		
OCNG_RB Note 1		dB		
N_{oc} Note 2	Bands FDD_N	dBm/15 kHz	-98	
RSRP Note 3	Bands FDD_N	dBm/15 kHz	-94	
$\hat{E}_s / I_{ot}$		dB	4	
SCH_RP Note 3	Bands FDD_N	dBm/15 kHz	-94	
$\hat{E}_s / N_{oc}$		dB	4	
Io Note3	Bands FDD_N	dBm/4.5 MHz	-67.8	
Propagation Condition			AWGN	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

9.4 UTRAN FDD CPICH Ec/No

9.4.1 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy

9.4.1.1 Test purpose

To verify that the E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.4.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No

The accuracy requirements in table 9.4.1.3-1 are valid under the following conditions:

CPICH_RSCP$|_{dBm}$ ≥ -114 dBm for Bands I, IV, VI, X, XI, XIX and XXI

CPICH_RSCP$|_{dBm}$ ≥ -113 dBm for Band IX,

CPICH_RSCP$|_{dBm}$ ≥ -112 dBm for Bands II, V and VII,

CPICH_RSCP$|_{dBm}$ ≥ -111 dBm for Band III, VIII, XII, XIII, XIV, XX and XXII

CPICH_RSCP$|_{dBm}$ ≥ -110.5 dBm for Band XXV.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.4.1.3-1: UTRA FDD CPICH_Ec/Io absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions				
		Normal condition	Extreme condition	Band I, IV VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-90.5…-50 (Note 1)	-91…-50	-93...-50
NOTE 1: The condition is -92…-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.								

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.1.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.1.3-2: UTRA FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.1.

9.4.1.4 Test description

9.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.4.1.4.3.

4. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.4.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit a RRCConnectionReconfiguration message on cell1.

4. The UE shall transmit a RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check UTRA FDD CPICH Ec/Io reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.4.1.5-4 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. If Test 2 not done, set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9. If Test 3 not done, set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 3. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 3.

9.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.4.1.4.3-1: CPICH_Ec/Io measurement configuration

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7

Table 9.4.1.4.3-2: *MeasConfig- DEFAULT:* CPICH_Ec/Io measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.1.4.3-3: *MeasResults*: CPICH_Ec/Io measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.1.4.3-4: MeasResultListUTRA: CPICH_Ec/Io measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.1.5 Test requirement

The test parameters are given in Tables 9.4.1.5-1, 9.4.1.5-2 and 9.4.1.5-3 as below. Table, 9.4.1.5-2 and 9.4.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.4.1.5-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table 9.4.1.5-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-94		
$\hat{E}_s / I_{ot}$	dB	4		
SCH_RP Note 3	dBm/15 kHz	-94		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.4.1.5-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter		Unit	Test 1	Test 2	Test 3
			Cell 2	Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12	-12
SCH_Ec/Ior		dB	-12	-12	-12
PICH_Ec/Ior		dB	-15	-15	-15
DPCH_Ec/Ior		dB	-	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/ 3.84 MHz	-53.12	-87.27	-93.76
	Band II, V, VII				-91.76
	Band XXV, XXVI				-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII				-90.76
	Band IX (Note 2)				-92.76
Îor/Ioc		dB	-1.45	-4.4	-9.14
CPICH Ec/Io, Note 1		dBm	-13.8	-15.75	-19.64
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/ 3.84 MHz	-50.77	-85.92	-93.26
	Band II, V, VII				-91.26
	Band XXV, XXVI				-89.76 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII				-90.26
	Band IX (Note 2)				-92.26
Propagation condition		-	AWGN	AWGN	AWGN
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE. NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not lose the Cell 2 in between the tests.					

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the reported values test requirements in table 9.4.1.5-4.

Table 9.4.1.5-4: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_17	CPICH_Ec/No_13	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_24	CPICH_Ec/No_22	CPICH_Ec/No_16
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_14	CPICH_Ec/No_11	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_27	CPICH_Ec/No_24	CPICH_Ec/No_16

9.4.2 E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy

9.4.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.4.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No.

The accuracy requirements in table 9.4.2.3-1 are valid under the following conditions:

CPICH_RSCP$|_{dBm}$ ≥ -114 dBm for Bands I, IV, VI, X, XI, XIX and XXI,

CPICH_RSCP$|_{dBm}$ ≥ -113 dBm for Band IX

CPICH_RSCP$|_{dBm}$ ≥ -112 dBm for Bands II, V and VII,

CPICH_RSCP$|_{dBm}$ ≥ -111 dBm for Band III, VIII, XII, XIII, XIV and XX,

CPICH_RSCP$|_{dBm}$ ≥ -110.5 dBm for Band XXV.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.4.2.3-1: UTRAN FDD CPICH_Ec/Io absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions				
		Normal condition	Extreme condition	Band I, IV, VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-90.5...-50 (Note 1)	-91…-50	-93...-50
NOTE 1: The condition is -92…-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.								

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.2.3-2 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.2.3-2: UTRAN FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.2.

9.4.2.4 Test description

9.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.4.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.4.2.4.1-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 as appropriate for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_Ec/Io reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.4.2.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. If Test 2 not done, set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9. If Test 3 not done, set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 for Test 3. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 3.

9.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.4.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.2.5 Test requirement

The test parameters are given in Tables 9.4.2.4.1-1, 9.4.2.5-1 and 9.4.2.5-2 as below. Table 9.4.2.5-1 and 9.4.2.5-2 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the reported values test requirements in table 9.4.2.5-3.

Table 9.4.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note1		6		
Uplink-downlink configuration Note1		1		
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 2	dB			
OCNG_RB Note 2	dB			
N_{oc} Note 3	dBm/15 kHz	-98		
RSRP Note 4	dBm/15 kHz	-94		
$\hat{E}_s / I_{ot}$	dB	4		
SCH_RP Note 4	dBm/15 kHz	-94		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation Condition		AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.4.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2	Test 3
			Cell 2	Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12	-12
SCH_Ec/Ior		dB	-12	-12	-12
PICH_Ec/Ior		dB	-15	-15	-15
DPCH_Ec/Ior		dB	-	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94	-0.94
Ioc	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-53.12	-87.27	-93.76
	Band II, V, VII, XI				-91.76
	Band XXV, XXVI				-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII				-90.76
	Band IX (Note 2)				-92.76
Îor/Ioc		dB	-1.45	-4.4	-9.14
CPICH Ec/Io, Note 1		dBm	-13.8	-15.75	-19.64
Io, Note 1	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-50.77	-85.92	-93.26
	Band II, V, VII, XI				-91.26
	Band XXV, XXVI				-89.76 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII				-90.26
	Band IX (Note 2)				-92.26
Propagation condition		-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

Table 9.4.2.5-3: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_17	CPICH_Ec/No_13	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_24	CPICH_Ec/No_22	CPICH_Ec/No_16
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_14	CPICH_Ec/No_11	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_27	CPICH_Ec/No_24	CPICH_Ec/No_16

9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth

9.4.3.1 Test purpose

To verify that the E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits for bands within band group FDD_N.

9.4.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support E-UTRA bands within band group FDD_N and UTRA FDD.

9.4.3.3 Minimum conformance requirements

The measurement period for RRC_CONNECTED state is specified in TS 36.133 [4] clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No in TS 25.133 [18].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.3.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.3.3-2: UTRA FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.3.

9.4.3.4 Test description

9.4.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.4.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.4.3.4.3.

5. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.4.3.4.1-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 9.4.1.5-1 for other general test parameters.			

9.4.3.4.2 Test procedure

Same test procedure as defined in clause 9.4.1.4.2 with the following exceptions:

- Instead of Table 9.4.1.5-2 → use Table 9.4.3.5-1.

9.4.3.4.3 Message contents

Same message contents as defined in clause 9.4.1.4.3.

9.4.3.5 Test requirement

The test parameters are given in Tables 9.4.1.4.1-1, 9.4.3.5-1 and 9.4.1.5-3. Tables 9.4.3.5-1 and 9.4.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.4.1.5-4 defines the UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values.

Table 9.4.3.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter		Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number			1		
$BW_{channel}$		MHz	5		
OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD)			OP.15 FDD		
PBCH_RA		dB	0		
PBCH_RB		dB			
PSS_RA		dB			
SSS_RA		dB			
PCFICH_RB		dB			
PHICH_RA		dB			
PHICH_RB		dB			
PDCCH_RA		dB			
PDCCH_RB		dB			
PDSCH_RA		dB			
PDSCH_RB		dB			
OCNG_RA Note 1		dB			
OCNG_RB Note 1		dB			
N_{oc} Note 2	Bands FDD_N	dBm/15 kHz	-98		
RSRP Note 3	Bands FDD_N	dBm/15 kHz	-94		
$\hat{E}_s / I_{ot}$		dB	4		
SCH_RP Note 3	Bands FDD_N	dBm/15 kHz	-94		
$\hat{E}_s / N_{oc}$		dB	4		
Io Note3	Bands FDD_N	dBm/4.5 MHz	-67.8		
Propagation Condition			AWGN		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

9.5 UTRAN TDD P-CCPCH RSCP

9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy

9.5.1.1 Test purpose

To verify that the UTRAN TDD P-CCPCH RSCP absolute measurement accuracy is within the specified limits.

9.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 39.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 22.

9.5.1.3 Minimum conformance requirements

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for URAN TDD P-CCPCH RSCP in 3GPP TS 25.123 [22].

The accuracy requirements in table 9.5.1.3-1 are valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io ≥ -8 dB

DwPCH_Ec/Io ≥ -5 dB

Table 9.5.1.3-1: UTRAN TDD P-CCPCH absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/ 1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.3 shall apply.

The reporting range is for URAN TDD P-CCPCH RSCP is from -115 …-25 dBm.

In table 9.5.1.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.5.1.3-2: UTRAN TDD P-CCPCH absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
P-CCPCH RSCP_LEV_-05	P-CCPCH RSCP <-120	dBm
P-CCPCH RSCP_LEV_-04	-120 ≤ P-CCPCH RSCP < -119	dBm
P-CCPCH RSCP_LEV_-03	-119 ≤ P-CCPCH RSCP < -118	dBm
…	…	…
PCCPCH_RSCP_LEV_89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV_90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV_91	-25 ≤ PCCPCH RSCP	dBm

The normative reference for this requirement is TS 25.123 [22] clause 9.1.1.1.1.2, clause 9.1.1.1.3 and TS 36.133 [4] clause 9.3.1 and A.9.5.1.

9.5.1.4 Test description

9.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.5.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.5.1.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.5.1.4.1-1: General test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA FDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

9.5.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.5.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check P-CCPCH RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.5.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.5.1.5-1 as appropriate.

9.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.5.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 9.5.1.4.3-2: *MeasConfig- DEFAULT:* Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig SEQUENCE {			
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-TDD	pccpch-RSCP		
}			
}			
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.5.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.5.1.4.3-4: MeasResultListUTRA: Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	Not Present		
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

9.5.1.5 Test requirement

The test parameters are given in Tables 9.5.1.4.1-1, 9.5.1.5-1 and 9.5.1.5-2 as below. Table 9.5.1.5-2 and 9.5.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.5.1.5-1: E-UTRAN FDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	dBm/15 kHz	-98		
$\hat{E}_s / I_{ot}$	dB	4		
RSRP Note3	dBm/15 kHz	-94		
Io Note3	dBm/9 MHz	-64.76		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation condition	-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.5.1.5-2: UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1		Test 2		Test 3	
DL timeslot number		0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel number Note2		Channel 2		Channel 2		Channel 2	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
DwPCH_Ec/Ior	dB		0		0		0
OCNS_Ec/Ior	dB	-3		-3		-3	
Ioc	dBm/1.28MHz	-54.9		-75.2		-96.8	
Îor/Ioc	dB	2		5		0	
PCCPCH RSCP Note1	dBm	-55.9		-73.2		-99.2	
Io Note1	dBm/1.28MHz	-50.78		-69.01		-93.19	
Propagation condition		AWGN					

Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

Each UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.5.1.5-3.

Table 9.5.1.5-3: UTRAN TDD P-CCPCH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_51	P-CCPCH RSCP_LEV 34	P-CCPCH RSCP_LEV 10
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_68	P-CCPCH RSCP_LEV 51	P-CCPCH RSCP_LEV 23
Extreme Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_48	P-CCPCH RSCP_LEV 31	P-CCPCH RSCP_LEV 07
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_71	P-CCPCH RSCP_LEV 54	P-CCPCH RSCP_LEV 26

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy

9.5.2.1 Test purpose

To verify that the UTRAN TDD P-CCPCH RSCP absolute measurement accuracy is within the specified limits.

9.5.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 39.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 22.

9.5.2.3 Minimum conformance requirements

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for URAN TDD P-CCPCH RSCP in 3GPP TS 25.123 [22].

The accuracy requirements in table 9.5.2.3-1 are valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io $\geq$ -8 dB

DwPCH_Ec/Io $\geq$ -5 dB

Table 9.5.2.3-1: UTRAN TDD P-CCPCH absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/ 1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.3 shall apply.

The reporting range is for URAN TDD P-CCPCH RSCP is from -115 …-25 dBm.

In table 9.5.2.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.5.2.3-2: UTRAN TDD P-CCPCH absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV -05	P-CCPCH RSCP <-120	dBm
PCCPCH_RSCP_LEV -04	-120 ≤ P-CCPCH RSCP < -119	dBm
PCCPCH_RSCP_LEV -03	-119 ≤ P-CCPCH RSCP < -118	dBm
…	…	…
PCCPCH_RSCP_LEV_89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV_90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV_91	-25 ≤ PCCPCH RSCP	dBm

The normative reference for this requirement is TS 25.123 [22] clause 9.1.1.1.1.2, clause 9.1.1.1.3 and TS 36.133 [4] clause 9.3.1 and A.9.5.2.

9.5.2.4 Test description

9.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22 for UE with 2Rx RF band and Annex A, Figure A.86 for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.5.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.5.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.5.2.4.1-1: General test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA TDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

9.5.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.5.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check P-CCPCH RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.5.2.5-3 If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one..

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.5.2.5-1 as appropriate.

9.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.5.2.4.3-1: Common Exception messages for E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 9.5.2.4.3-2: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig SEQUENCE {			
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-TDD	pccpch-RSCP		
}			
}			
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.5.2.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.5.2.4.3-4: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	Not Present		
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

9.5.2.5 Test requirement

The test parameters are given in Tables 9.5.2.4.1-1, 9.5.2.5-1 and 9.5.2.5-2 as below. Table 9.5.2.5-2 and 9.5.2.5-3 define the primary level settings including test tolerances for all tests.

Table 9.5.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	dBm/15 kHz	-98		
$\hat{E}_s / I_{ot}$	dB	4		
RSRP Note3	dBm/15 kHz	-94		
Io Note3	dBm/9 MHz	-64.76		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation condition	-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.5.2.5-2: UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1		Test 2		Test 3	
DL timeslot number		0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel number Note2		Channel 2		Channel 2		Channel 2	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
DwPCH_Ec/Ior	dB		0		0		0
OCNS_Ec/Ior	dB	-3		-3		-3	
Ioc	dBm/1.28MHz	-54.9		-75.2		-96.2	
Îor/Ioc	dB	2		5		0	
PCCPCH RSCP Note1	dBm	-55.9		-73.2		-99.2	
Io Note1	dBm/1.28MHz	-50.78		-69.01		-93.19	
Propagation condition		AWGN					

Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

Each UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.5.2.5-3.

Table 9.5.2.5-3: UTRAN TDD P-CCPCH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_51	P-CCPCH RSCP_LEV 34	P-CCPCH RSCP_LEV 10
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_68	P-CCPCH RSCP_LEV 51	P-CCPCH RSCP_LEV 23
Extreme Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_48	P-CCPCH RSCP_LEV 31	P-CCPCH RSCP_LEV 07
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_71	P-CCPCH RSCP_LEV 54	P-CCPCH RSCP_LEV 26

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.6 GSM carrier RSSI

9.6.1 GSM RSSI accuracy for E-UTRAN FDD

9.6.1.1 Test purpose

To verify that the GSM RSSI measurement accuracy is within the specified limits.

9.6.1.2 Test applicability

This test applies all the types of E-UTRA FDD UE release 9 and forward that support GSM. Applicability requires support for FGI bits 16 and 23.

9.6.1.3 Minimum conformance requirements

Absolute accuracy

The R.M.S received signal level at the receiver input shall be measured by the MS and the BSS over the full range of -110 dBm to -48 dBm with an absolute accuracy of ±4 dB from -110 dBm to -70 dBm under normal conditions and ±6 dB over the full range under both normal and extreme conditions. The R.M.S received signal level at the receiver input shall be measured by the MS above -48 dBm up to -38 dBm with an absolute accuracy of ± 9 dB under both normal and extreme conditions.

This requirement is summarized in Table 9.6.1.3-1.

Table 9.6.1.3-1: GSM RXLEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RXLEV	dBm	± 4	± 6	-110…-70
	dBm	± 6	± 6	-70…-48
	dBm	± 9	± 9	-48..-38

The reporting range and mapping for RXLEV is summarized in Table 9.6.1.3-2.

Table 9.6.1.3-2: GSM RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RXLEV_00	RXLEV < -110	dBm
RXLEV_01	-110 ≤ RXLEV < -109	dBm
RXLEV_02	-109 ≤ RXLEV < -108	dBm
…	…	…
RXLEV_61	-50≤ RXLEV < -49	dBm
RXLEV_62	-49 ≤ RXLEV < -48	dBm
RXLEV_63	-48 ≤ RXLEV	dBm

Relative accuracy

The relative accuracy shall be as follows:

If signals of level x1 and x2 dBm are received (where x1 ≤ x2) and levels y1 and y2 dBm respectively are measured, if x2 - x1 < 20 dB and x1 is not below the reference sensitivity level, then y1 and y2 shall be such that:

(x2 - x1) - a ≤ y2 - y1 ≤ (x2 - x1 + b) if the measurements are on the same or on different RF channel within the same frequency band;

and

(x2 - x1) - c ≤ y2 - y1 ≤(x2 - x1 + d) if the measurements are on different frequency bands:

a, b, c and d are in dB and depend on the value of x1 as follows:

	a	**b**	**c**	**d**
x1 ≥ s+14, x2< -48 dBm	2	2	4	4
s+14 > x1 ≥ s+1	3	2	5	4
s+1 > x1	4	2	6	4

For single band MS and measurements between ARFCN in the same band for a multiband MS:

s = reference sensitivity level as specified in Table 9.6.1.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a)

For measurements between ARFCN in different bands:

s = the reference sensitivity level as specified in Table 9.6.1.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a) for the band including x1.

Table 9.6.1.3-3: Reference sensitivity level for MS

GSM 400 MS	for GSM 400 small MS	-102 dBm
	for other GSM 400 MS	-104 dBm
GSM 900 MS	for GSM 900 small MS	-102 dBm
	for other GSM 900 MS	-104 dBm
GSM 850 MS	for GSM 850 small MS	-102 dBm
	for other GSM 850 MS	-104 dBm
GSM 700 MS	for GSM 700 small MS	-102 dBm
	for other GSM 700 MS	-104 dBm
DCS 1 800 MS	for DCS 1 800 class 1 or class 2 MS	-100 / -102 dBm *
	for DCS 1 800 class 3 MS	-102 dBm
PCS 1 900 MS	for PCS 1 900 class 1 or class 2 MS	-102 dBm
	for other PCS 1 900 MS	-104 dBm
Note: For DCS 1 800 class 1 and class 2 MS, the 102 dBm level shall apply for the reference sensitivity performance as specified in table 1 for the normal conditions defined in TS 45.005 [16] Annex D and 100 dBm level shall be used to determine all other MS performances.		

The normative reference for this requirement is:

For E-UTRA: TS 36.133 [4] clause 9.4.1 and A.9.6.1

For GSM: TS 45.008 [15] clause 8.1.2 and 8.1.4 and TS 45.005 [16].

9.6.1.4 Test description

9.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.6.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.6.1.4.3.

5. There is one E-UTRA FDD cell (Cell 1) and two GSM cells (Cell 2 and Cell 3) specified in each test. Cell 1 is the cell used for call setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (BCCH1) and Cell 3 (BCCH other than BCCH1 according to sub-test) are measured and reported by the UE.

Table 9.6.1.4.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell	-	Cell 1	
DRX	-	OFF	
Gap pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

9.6.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.6.1.5-1, 9.6 1.5-2 and 9.6 1.5-3 as appropriate. Propagation conditions for the E-UTRA cell are set according to Annex B clause B.1. For sub-test 4 and sub-test 12 GERAN cell is initialized to -95dBm.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. Only for sub-tests 4 and 12, SS waits for 10s for initial measurement report by UE and ignores measurement reports received at this stage. If SS receives the measurement reports, then adjust the power levels of Cell 2 according to Table

9.6.1.5-2. SS ignores measurement reports for 1 reportInterval cycle (1024ms) and continues with step 7, else fail the UE for the relevant subtest and skip to Step.9

7. SS shall check the reported GSM RSSI values in periodical MeasurementReport messages. The reported RSSI value for Cell 2 is compared to the actual RSSI value according to Table 9.6.1.5-4. This counts as a Pass or Fail for the event "Absolute". Also the reported RSSI value for Cell 3 is compared to the reported RSSI value for Cell 2 for each MeasurementReport message according to Table 9.6.1.5-5. This counts as a Pass or Fail for the event "Relative".
If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the event "Absolute" is increased by one.
If the UE fails to report the measurement value for any of Cell 2 or Cell 3, the number of failed iterations for the event "Relative" is increased by one.

8. The SS shall check the periodical MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved for each of the events "Absolute" and "Relative". Each event is evaluated only until the confidence level is achieved. Different events may require different times for a verdict.

9. Repeat step 1-9 for each sub-test in Table 9.6.1.5-2 as appropriate.

9.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.6.1.4.3-1: Common Exception messages for GSM RSSI measurement accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-11

Table 9.6.1.4.3-2: MeasuredResults: Additional GSM RSSI measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListGERAN	MeasResultListGERAN		
}			
}			

Table 9.6.1.4.3-3: MeasResultListGERAN: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
Cgi-Info	Not present		
measResult SEQUENCE {			
Rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

Table 9.6.1.4.3-4: ReportConfigInterRAT-PERIODICAL: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-9 ReportConfigInterRAT-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-PERIODICAL ::= SEQUENCE {			
maxReportCells	6		
}			

9.6.1.5 Test requirement

Tables 9.6.1.5-1, 9.6.1.5-2 and 9.6.1.5-3 define the primary level settings including test tolerances for all tests.

The GSM RSSI measurement accuracy test for the reported values shall meet the requirements in Table 9.6.1.5-4 and Table 9.6.1.5-5.

Table 9.6.1.5-1: E-UTRAN FDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN FDD

Parameter	Unit	Tests 1-12
E-UTRAN RF Channel Number		1
$BW_{channel}$	MHz	10
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD

PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s / I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s / N_{oc}$	dB	4
Propagation Condition		AWGN

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.6.1.5-2: BCCH signal levels at receiver input in dBm

Sub-test	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
1	-38.7	-38.5	NA	NA	NA	NA
2	-48.7	-50.0	NA	NA	NA	NA
3	-70.7	-70.5	NA	NA	NA	NA
4	-109.3	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

Table 9.6.1.5-3: ARFCN numbers for GSM cells

GSM band	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
GSM 450	276	293	264	269	281	288
GSM 480	323	340	311	316	328	335
GSM 750	475	511	440	455	485	500
GSM 850	189	251	150	170	210	230
GSM 900	62	124	20	40	80	100
DCS 1800	700	885	585	660	790	835
PCS 1900	700	805	585	660	790	550

Note: As defined in clause 3A.1, the test shall run without frequency overlapping between E-UTRA and GSM cells. The ARFCN numbers defined here, can be updated accordingly (even E-UTRA band specific) to avoid possible overlapping.

Table 9.6.1.5-4: GSM Carrier RSSI absolute accuracy requirements for the reported values

Sub-test	Normal Condition		Extreme condition	
	Lowest reported value for BCCH1	Highest reported value for BCCH1	Lowest reported value for BCCH1	Highest reported value for BCCH1
1	RXLEV_62	RXLEV_63	RXLEV_62	RXLEV_63
2	RXLEV_55	RXLEV_63	RXLEV_55	RXLEV_63
3	RXLEV_35	RXLEV_45	RXLEV_33	RXLEV_47
4	RXLEV_00	RXLEV_06	RXLEV_00	RXLEV_08
5	RXLEV_46	RXLEV_60	RXLEV_46	RXLEV_60
6	RXLEV_39	RXLEV_53	RXLEV_39	RXLEV_53
7	RXLEV_34	RXLEV_44	RXLEV_32	RXLEV_46
8	RXLEV_27	RXLEV_37	RXLEV_25	RXLEV_39
9	RXLEV_20	RXLEV_30	RXLEV_18	RXLEV_32
10	RXLEV_13	RXLEV_23	RXLEV_11	RXLEV_25
11	RXLEV_06	RXLEV_16	RXLEV_04	RXLEV_18
12	RXLEV_00	RXLEV_09	RXLEV_00	RXLEV_11
Note: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the absolute accuracy for sub-test 12 is not tested.				

Table 9.6.1.5-5: GSM Carrier RSSI Relative accuracy requirements for the reported values

Sub-test	Normal & Extreme condition	
	Lowest reported value for BCCH2	Highest reported value for BCCH2
1	N/A (Note3)	N/A(Note3)
2	RXLEV = x-6	RXLEV = x+3
3	RXLEV = x-4	RXLEV = x+5
4	N/A (Note3)	N/A (Note3)
	Lowest reported value for BCCH3	Highest reported value for BCCH3
5	RXLEV = x-2	RXLEV = x+8
6	RXLEV = x+1	RXLEV = x+10
	Lowest reported value for BCCH4	Highest reported value for BCCH4
7	RXLEV = x+3	RXLEV = x+12
8	RXLEV = x+5	RXLEV = x+14
	Lowest reported value for BCCH5	Highest reported value for BCCH5
9	RXLEV = x+7	RXLEV = x+16
10	RXLEV = x+8	RXLEV = x+18
	Lowest reported value for BCCH6	Highest reported value for BCCH6
11	RXLEV = x+10	RXLEV = x+20
12	N/A (Note3)	N/A (Note3)
Note 1: x is the reported value RXLEV for BCCH1. Note 2: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the relative accuracy for sub-test 12 is not tested. Note 3: Sub-tests 1, 4 and 12 are not applicable for relative accuracy as they would be testing the UE outside the side conditions.		

For the test to pass, the ratio of successful reported values in each sub-test for absolute and relative accuracy shall be more than 90% with a confidence level of 95%.

9.6.2 GSM RSSI accuracy for E-UTRAN TDD

9.6.2.1 Test purpose

To verify that the GSM RSSI measurement accuracy is within the specified limits.

9.6.2.2 Test applicability

This test applies all the types of E-UTRA TDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 16 and 23.

9.6.2.3 Minimum conformance requirements

Absolute accuracy

The R.M.S received signal level at the receiver input shall be measured by the MS and the BSS over the full range of -110 dBm to -48 dBm with an absolute accuracy of ±4 dB from -110 dBm to -70 dBm under normal conditions and ±6 dB over the full range under both normal and extreme conditions. The R.M.S received signal level at the receiver input shall be measured by the MS above -48 dBm up to -38 dBm with an absolute accuracy of ± 9 dB under both normal and extreme conditions.

This requirement is summarized in Table 9.6.2.3-1.

Table 9.6.2.3-1: GSM RXLEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RXLEV	dBm	± 4	± 6	-110…-70
	dBm	± 6	± 6	-70…-48
	dBm	± 9	± 9	-48..-38

The reporting range and mapping for RXLEV is summarized in Table 9.6.2.3-2.

Table 9.6.2.3-2: GSM RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RXLEV_00	RXLEV < -110	dBm
RXLEV_01	-110 ≤ RXLEV < -109	dBm
RXLEV_02	-109 ≤ RXLEV < -108	dBm
…	…	…
RXLEV_61	-50 ≤ RXLEV < -49	dBm
RXLEV_62	-49 ≤ RXLEV < -48	dBm
RXLEV_63	-48 ≤ RXLEV	dBm

Relative accuracy

The relative accuracy shall be as follows:

If signals of level x1 and x2 dBm are received (where x1 ≤ x2) and levels y1 and y2 dBm respectively are measured, if x2 - x1 < 20 dB and x1 is not below the reference sensitivity level, then y1 and y2 shall be such that:

(x2 - x1) - a ≤ y2 - y1 ≤ (x2 - x1 + b) if the measurements are on the same or on different RF channel within the same frequency band;

and

(x2 - x1) - c ≤ y2 - y1 ≤(x2 - x1 + d) if the measurements are on different frequency bands:

a, b, c and d are in dB and depend on the value of x1 as follows:

	a	b	c	d
x1 ≥ s+14, x2< -48 dBm	2	2	4	4
s+14 > x1 ≥ s+1	3	2	5	4
s+1 > x1	4	2	6	4

For single band MS and measurements between ARFCN in the same band for a multiband MS:

s = reference sensitivity level as specified in Table 9.6.2.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a)

For measurements between ARFCN in different bands:

s = the reference sensitivity level as specified in Table 9.6.2.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a) for the band including x1.

Table 9.6.2.3-3: Reference sensitivity level for MS

GSM 400 MS	for GSM 400 small MS	-102 dBm
	for other GSM 400 MS	-104 dBm
GSM 900 MS	for GSM 900 small MS	-102 dBm
	for other GSM 900 MS	-104 dBm
GSM 850 MS	for GSM 850 small MS	-102 dBm
	for other GSM 850 MS	-104 dBm
GSM 700 MS	for GSM 700 small MS	-102 dBm
	for other GSM 700 MS	-104 dBm
DCS 1 800 MS	for DCS 1 800 class 1 or class 2 MS	-100 / -102 dBm *
	for DCS 1 800 class 3 MS	-102 dBm
PCS 1 900 MS	for PCS 1 900 class 1 or class 2 MS	-102 dBm
	for other PCS 1 900 MS	-104 dBm
Note: For DCS 1 800 class 1 and class 2 MS, the 102 dBm level shall apply for the reference sensitivity performance as specified in table 1 for the normal conditions defined in TS 45.005 [16] Annex D and 100 dBm level shall be used to determine all other MS performances.		

The normative reference for this requirement is:

For E-UTRA: TS 36.133 [4] clause 9.4.1 and A.9.6.2

For GSM: TS 45.008 [15] clause 8.1.2 and 8.1.4 and TS 45.005 [16].

9.6.2.4 Test description

9.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UE with 2Rx RF band and Annex A, Figure A.78 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. The general test parameter settings are set up according to Table 9.6.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.6.2.4.3.

5. There is one E-UTRA TDD cell (Cell 1) and two GSM cells (Cell 2 and Cell 3) specified in each test. Cell 1 is the cell used for call setup with the power level set according to Annexes C.0 and C.1 for this test. Cell 2 (BCCH1) and Cell 3 (BCCH other than BCCH1 according to sub-test) are measured and reported by the UE.

Table 9.6.2.4.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
Gap pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

9.6.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.6.2.5-1, 9.6 2.5-2 and 9.6 2.5-3 as appropriate. Propagation conditions for the E-UTRA cell are set according to Annex B clause B.1. For sub-test 4 and sub-test 12 GERAN cell is initialized to -95dBm.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. Only for sub-tests 4 and 12, SS waits for 10s for initial measurement report by UE and ignores measurement reports received at this stage. If SS receives the measurement reports, then adjust the power levels of Cell 2 according to Table 9.6.2.5-2. SS ignores measurement reports for 1 reportInterval cycle (1024ms) and continues with step 7, else fails the UE for the relevant sub-test and skip to Step.9.

7. SS shall check the reported GSM RSSI value in periodical MeasurementReport messages. The reported RSSI value for Cell 2 is compared to the actual RSSI value according to Table 9.6.2.5-4. This counts as a Pass or Fail for the event “Absolute”. Also the reported RSSI value for Cell 3 is compared to the reported RSSI value for Cell 2 for each MeasurementReport message according to Table 9.6.2.5-5. This counts as a Pass or Fail for the event “Relative”.
If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the event “Absolute” is increased by one.
If the UE fails to report the measurement value for any of Cell 2 or Cell 3, the number of failed iterations for the event ”Relative” is increased by one.

8. The SS shall check the periodical MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved for each of the events "Absolute” and “Relative”. Each event is evaluated only until the confidence level is achieved. Different events may require different times for a verdict.

9. Repeat step 1-9 for each sub-test in Table 9.6.2.5-2 as appropriate.

9.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.6.2.4.3-1: Common Exception messages for GSM RSSI measurement accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-11

Table 9.6.2.4.3-2: MeasuredResults: Additional GSM RSSI measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListGERAN	MeasResultListGERAN		
}			
}			

Table 9.6.2.4.3-3: MeasResultListGERAN: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
Cgi-Info	Not present		
measResult SEQUENCE {			
Rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

Table 9.6.2.4.3-4: ReportConfigInterRAT-PERIODICAL: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-9 ReportConfigInterRAT-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-PERIODICAL ::= SEQUENCE {			
maxReportCells	6		
}			

9.6.2.5 Test requirement

Tables 9.6.2.5-1, 9.6.2.5-2 and 9.6.2.5-3 define the primary level settings including test tolerances for all tests.

The GSM RSSI measurement accuracy test for the reported values shall meet the requirements in Table 9.6.2.5-4 and Table 9.6.2.5-5.

Table 9.6.2.5-1: E-UTRAN TDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN TDD

Parameter	Unit	Tests 1 - 12
E-UTRAN RF Channel Number		1
$BW_{channel}$	MHz	10
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s / I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s / N_{oc}$	dB	4
Propagation Condition		AWGN

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.6.2.5-2: BCCH signal levels at receiver input in dBm

Sub-test	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
1	-38.7	-38.5	NA	NA	NA	NA
2	-48.7	-50.0	NA	NA	NA	NA
3	-70.7	-70.5	NA	NA	NA	NA
4	-109.3	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

Table 9.6.2.5-3: ARFCN numbers for GSM cells

GSM band	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
GSM 450	276	293	264	269	281	288
GSM 480	323	340	311	316	328	335
GSM 750	475	511	440	455	485	500
GSM 850	189	251	150	170	210	230
GSM 900	62	124	20	40	80	100
DCS 1800	700	885	585	660	790	835
PCS 1900	700	805	585	660	790	550
Note: As defined in clause 3A.1, the test shall run without frequency overlapping between E-UTRA and GSM cells. The ARFCN numbers defined here, can be updated accordingly (even E-UTRA band specific) to avoid possible overlapping.						

Table 9.6.2.5-4: GSM Carrier RSSI absolute accuracy requirements for the reported values

Sub-test	Normal condition		Extreme condition	
	Lowest reported value for BCCH1	Highest reported value for BCCH1	Lowest reported value for BCCH1	Highest reported value for BCCH1
1	RXLEV_62	RXLEV_63	RXLEV_62	RXLEV_63
2	RXLEV_55	RXLEV_63	RXLEV_55	RXLEV_63
3	RXLEV_35	RXLEV_45	RXLEV_33	RXLEV_47
4	RXLEV_00	RXLEV_06	RXLEV_00	RXLEV_08
5	RXLEV_46	RXLEV_60	RXLEV_46	RXLEV_60
6	RXLEV_39	RXLEV_53	RXLEV_39	RXLEV_53
7	RXLEV_34	RXLEV_44	RXLEV_32	RXLEV_46
8	RXLEV_27	RXLEV_37	RXLEV_25	RXLEV_39
9	RXLEV_20	RXLEV_30	RXLEV_18	RXLEV_32
10	RXLEV_13	RXLEV_23	RXLEV_11	RXLEV_25
11	RXLEV_06	RXLEV_16	RXLEV_04	RXLEV_18
12	RXLEV_00	RXLEV_09	RXLEV_00	RXLEV_11
Note: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the absolute accuracy for sub-test 12 is not tested.				

Table 9.6.2.5-5: GSM Carrier RSSI Relative accuracy requirements for the reported values

Sub-test	Normal & Extreme condition	
	Lowest reported value for BCCH2	Highest reported value for BCCH2
1	N/A (Note3)	N/A (Note3)
2	RXLEV = x-6	RXLEV = x+3
3	RXLEV = x-4	RXLEV = x+5
4	N/A (Note3)	N/A (Note3)
	Lowest reported value for BCCH3	Highest reported value for BCCH3
5	RXLEV = x-2	RXLEV = x+8
6	RXLEV = x+1	RXLEV = x+10
	Lowest reported value for BCCH4	Highest reported value for BCCH4
7	RXLEV = x+3	RXLEV = x+12
8	RXLEV = x+5	RXLEV = x+14
	Lowest reported value for BCCH5	Highest reported value for BCCH5
9	RXLEV = x+7	RXLEV = x+16
10	RXLEV = x+8	RXLEV = x+18
	Lowest reported value for BCCH6	Highest reported value for BCCH6
11	RXLEV = x+10	RXLEV = x+20
12	N/A (Note3)	N/A (Note3)
Note 1: x is the reported value RXLEV for BCCH1. Note 2: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the relative accuracy for sub-test 12 is not tested. Note 3: Sub-tests 1, 4 and 12 are not applicable for relative accuracy as they would be testing the UE outside the side conditions.		

For the test to pass, the ratio of successful reported values in each sub-test for absolute and relative accuracy shall be more than 90% with a confidence level of 95%.

9.7 UE Rx – Tx Time Difference

The UE Rx – Tx Time difference test cases can be found in TS 37.571-1 [27].

9.8 RSTD

The RSTD test cases can be found in TS 37.571-1 [27].

9.9 Serving Cell RSRP and RSRQ

9.9.1 FDD Serving Cell RSRP and RSRQ Accuracy

9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy

9.9.1.1.1 Test purpose

To verify the FDD intra-frequency serving cell absolute RSRP measurement accuracy is within the specified limit.

9.9.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11. Applicability requires support for FGI bit 16.

9.9.1.1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in table 9.9.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 2 / dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, FDD_C, FDD_D, FDD_E, FDD_F, FDD_G, FDD_H, TDD_A, TDD_C, TDD_E	N/A / -70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.1.

9.9.1.1.4 Test description

9.9.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.1.1.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.1.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.1.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 1 reported by the UE is compared to actual RSRP value according to Table 9.9.1.1.5-2.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.9.1.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.9.1.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.1.1.5 Test requirement

Table 9.9.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.1.1.5-2.

Table 9.9.1.1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter	Unit	Test
		Cell 1

E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.1-1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1-1			R.6 FDD
OCNG Patterns defined in D.1.1-1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-120.4
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s / I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A	dBm/15 kHz	-124.4
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A	dB	-14.93
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A	dBm/9 MHz	-91.16
	Bands FDD_C		-90.16
	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16
	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66

$\hat{E}_s / N_{oc}$	dB	-4
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.		
Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.		
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.		
Note 6: E-UTRA operating band groups are as defined in Section 3.5.		
Note 7: Except Band 29 and Band 32.		

Table 9.9.1.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_9
	Bands FDD_C	RSRP_10
	Bands FDD_D	RSRP_10
	Bands FDD_E Bands FDD_F	RSRP_11
	Bands FDD_G	RSRP_12
	Bands FDD_H	RSRP_12
Highest reported value (Cell 1)	Bands FDD_A	RSRP_24
	Bands FDD_C	RSRP_25
	Bands FDD_D	RSRP_25
	Bands FDD_E Bands FDD_F	RSRP_26
	Bands FDD_G	RSRP_27
	Bands FDD_H	RSRP_27
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_6
	Bands FDD_C	RSRP_7
	Bands FDD_D	RSRP_7
	Bands FDD_E Bands FDD_F	RSRP_8
	Bands FDD_G	RSRP_9
	Bands FDD_H	RSRP_9
Highest reported value (Cell 1)	Bands FDD_A	RSRP_27
	Bands FDD_C	RSRP_28
	Bands FDD_D	RSRP_28
	Bands FDD_E Bands FDD_F	RSRP_29
	Bands FDD_G	RSRP_30
	Bands FDD_H	RSRP_30

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)

9.9.1.1_1.1 Test purpose

Same test purpose as in clause 9.9.1.1.1.

9.9.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.9.1.1_1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in table 9.9.1.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.1_1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.1.

9.9.1.1_1.4 Test description

9.9.1.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.9.1.1.4.1 with the following exceptions:

- Instead of 9.9.1.1.4.3 → use 9.9.1.1_1.4.3.

9.9.1.1_1.4.2 Test procedure

Same test procedure as in clause 9.9.1.1.4.2 with the following exceptions:

- Instead of Table 9.9.1.1.5-1 → use Table 9.9.1.1_1.5-1.
- Instead of Table 9.9.1.1.5-2 → use Table 9.9.1.1_1.5-2.

9.9.1.1_1.4.3 Message contents

Same message contents as in clause 9.9.1.1.4.3.

9.9.1.1_1.5 Test requirement

Table 9.9.1.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.1.1_1.5-2.

Table 9.9.1.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A Note 8	dBm/15 kHz	-120.4
	Bands FDD_B1, FDD_B2		-119.9
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s / I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A Note 8	dBm/15 kHz	-124.4
	Bands FDD_B1, FDD_B2		-123.9
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A Note 8	dB	-14.93
	Bands FDD_B1, FDD_B2		
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A Note 8	dBm/9 MHz	-91.16
	Bands FDD_B1, FDD_B2		-90.66
	Bands FDD_C		-90.16

	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16
	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66
$\hat{E}_s / N_{oc}$		dB	-4
Propagation condition		-	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 7: Except Band 29.

Note 8: Except Band 32.

Table 9.9.1.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_10
	Bands FDD_B1, FDD_B2	RSRP_11
	Bands FDD_C	RSRP_11
	Bands FDD_D	RSRP_12
	Bands FDD_E Bands FDD_F	RSRP_12
	Bands FDD_G	RSRP_13
	Bands FDD_H	RSRP_14
Highest reported value (Cell 1)	Bands FDD_A	RSRP_22
	Bands FDD_B1, FDD_B2	RSRP_23
	Bands FDD_C	RSRP_23
	Bands FDD_D	RSRP_24
	Bands FDD_E Bands FDD_F	RSRP_24
	Bands FDD_G	RSRP_25
	Bands FDD_H	RSRP_26
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_6
	Bands FDD_B1, FDD_B2	RSRP_6
	Bands FDD_C	RSRP_7
	Bands FDD_D	RSRP_7
	Bands FDD_E Bands FDD_F	RSRP_8
	Bands FDD_G	RSRP_9
	Bands FDD_H	RSRP_9

Highest reported value (Cell 1)	Bands FDD_A	RSRP_27
	Bands FDD_B1, FDD_B2	RSRP_27
	Bands FDD_C	RSRP_28
	Bands FDD_D	RSRP_28
	Bands FDD_E Bands FDD_F	RSRP_29
	Bands FDD_G	RSRP_30
	Bands FDD_H	RSRP_30

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy

9.9.1.2.1 Test purpose

To verify the FDD intra-frequency serving cell absolute RSRQ measurement accuracy is within the specified limit.

9.9.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 16.

9.9.1.2.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured of the serving cell.

The accuracy requirements in table 9.9.1.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.2.3-1: RSRQ FDD intra frequency absolute accuracy

Accuracy		**Conditions**			
			Io Note 1 **range**		
Normal condition	**Extreme condition**	**Ês/Iot**	**E-UTRA operating band groups** Note 4	**Minimum Io**	**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz** Note 3	**dBm/BW$_{Channel}$**
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. Note 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. Note 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.2.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.9.1.

9.9.1.2.4 Test description

9.9.1.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.1.2.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.1.2.4.2 Test procedure

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured from the serving cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.1.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of serving Cell 1 reported by the UE is compared to the actual RSRQ according to Table 9.9.1.2.5-2.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.1.2.4.3-1: Common Exception messages for RSRQ FDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.9.1.2.4.3-2: *MeasResults*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.1.2.5 Test requirement

Table 9.9.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.9.1.2.5-2.

Table 9.9.1.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter	Unit	Test
		Cell 1

E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.1-1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1-1			R.6 FDD
OCNG Patterns defined in D.1.1-1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-120.4
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s / I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A	dBm/15 kHz	-124.4
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A	dB	-16.25
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A	dBm/9 MHz	-91.16
	Bands FDD_C		-90.16
	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16
	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66

$\hat{E}_s / N_{oc}$	dB	-4
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.		
Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.		
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.		
Note 6: E-UTRA operating band groups are as defined in Section 3.5.		
Note 7: Except Band 29 and Band 32.		

Table 9.9.1.2.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_15
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_16

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2 TDD Serving Cell RSRP and RSRQ Accuracy

9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy

9.9.2.1.1 Test purpose

To verify the TDD intra-frequency serving cell absolute RSRP measurement accuracy is within the specified limit.

9.9.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11. Applicability requires support for FGI bit 16.

9.9.2.1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in Table 9.9.2.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions			
			Io [Note 1] range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups [Note 3]	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz [Note 2] / dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121 / N/A	-70
			FDD_C, TDD_C	-120 / N/A	-70
			FDD_D	-119.5 / N/A	-70
			FDD_E, TDD_E	-119 / N/A	-70
			FDD_F	-118.5 / N/A	-70
			FDD_G	-118 / N/A	-70
			FDD_H	-117.5 / N/A	-70
±8	±11	≥-6 dB	FDD_A, FDD_C, FDD_D, FDD_E, FDD_F, FDD_G, FDD_H, TDD_A, TDD_C, TDD_E	N/A	-70 / -50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.2.

9.9.2.1.4 Test description

9.9.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.2.1.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.2.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.2.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 1 reported by the UE is compared to actual RSRP value according to Table 9.9.2.1.5-2.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.2.1.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.9.2.1.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
}			

9.9.2.1.5 Test requirement

Table 9.9.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.2.1.5-2.

Table 9.9.2.1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.2-1			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2-1			R.6 TDD
OCNG Patterns defined in D.2.1-1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s / I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-14.93
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s / N_{oc}$		dB	-4
Propagation condition		-	AWGN

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_9
	Bands TDD_C	RSRP_10
	Bands TDD_E	RSRP_11
Highest reported value (Cell 1)	Bands TDD_A	RSRP_24
	Bands TDD_C	RSRP_25
	Bands TDD_E	RSRP_26
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_6
	Bands TDD_C	RSRP_7
	Bands TDD_E	RSRP_8
Highest reported value (Cell 1)	Bands TDD_A	RSRP_27
	Bands TDD_C	RSRP_28
	Bands TDD_E	RSRP_29

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)

9.9.2.1_1.1 Test purpose

Same test purpose as in clause 9.9.2.1.1.

9.9.2.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.9.2.1_1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in Table 9.9.2.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.1_1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B1, FDD_B2	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.2.

9.9.2.1_1.4 Test description

9.9.2.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.9.2.1.4.1 with the following exceptions:

- Instead of 9.9.2.1.4.3 → use 9.9.2.1_1.4.3.

9.9.2.1_1.4.2 Test procedure

Same test procedure as in clause 9.9.1.1.4.2 with the following exceptions:

- Instead of Table 9.9.2.1.5-1 → use Table 9.9.2.1_1.5-1.
- Instead of Table 9.9.2.1.5-2 → use Table 9.9.2.1_1.5-2.

9.9.2.1_1.4.3 Message contents

Same message contents as in clause 9.9.2.1.4.3.

9.9.2.1_1.5 Test requirement

Table 9.9.2.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.2.1_1.5-2.

Table 9.9.2.1_1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s / I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-14.93
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s / N_{oc}$		dB	-4
Propagation condition		-	AWGN

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.1_1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_10
	Bands TDD_C	RSRP_11
	Bands TDD_E	RSRP_12
Highest reported value (Cell 1)	Bands TDD_A	RSRP_22
	Bands TDD_C	RSRP_23
	Bands TDD_E	RSRP_24
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_6
	Bands TDD_C	RSRP_7
	Bands TDD_E	RSRP_8
Highest reported value (Cell 1)	Bands TDD_A	RSRP_27
	Bands TDD_C	RSRP_28
	Bands TDD_E	RSRP_29

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy

9.9.2.2.1 Test purpose

To verify the TDD intra-frequency serving cell absolute RSRQ measurement accuracy is within the specified limit.

9.9.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 16.

9.9.2.2.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured of the serving cell.

The accuracy requirements in table 9.9.2.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.2.3-1: RSRQ TDD intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

Note 1: Io is assumed to have constant EPRE across the bandwidth.
Note 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
Note 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.2.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.9.2.

9.9.2.2.4 Test description

9.9.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18 for UE with 2Rx RF band and Annex A, Figure A.75 (without using the faders) for 4Rx capable UE without any 2Rx RF bands.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.2.2.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.2.2.4.2 Test procedure

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured from the serving cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.2.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of serving Cell 1 reported by the UE is compared to the actual RSRQ according to Table 9.9.2.2.5-2.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.2.2.4.3-1: Common Exception messages for RSRQ TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.9.2.2.4.3-2: *MeasResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.2.2.5 Test requirement

Table 9.9.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.9.2.2.5-2.

Table 9.9.2.2.5-1: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.2-1			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2-1			R.6 TDD
OCNG Patterns defined in D.2.1-1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s / I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-16.25
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s / N_{oc}$		dB	-4
Propagation condition		-	AWGN

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.2.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_15
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_16

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.10

9.11 RSSI Accuracy

9.11.1 FS3 average RSSI accuracy case (PCell using FDD)

9.11.1.1 Test purpose

To verify that the average RSSI measurement accuracy is within the specified limits for all FS3 bands.

9.11.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 13 onwards supporting Downlink LAA and RSSI reporting. Applicability requires support for rssi-AndChannelOccupancyReporting-r13.

9.11.1.3 Minimum conformance requirements

The absolute accuracy of RSSI measurements is defined as the RSSI measurements from a FS3 cell in CA operation with a serving FDD or TDD cell.

The accuracy requirements in table 9.11.1.3-1 are valid under the following conditions:

All symbols duing each RSSI measurement duration are available for RSSI sampling within the same reporting interval.

Table 9.11.1.3-1: Intra-frequency RSSI accuracy

Accuracy		Conditions		
		Io [Note 1] range		
Normal condition	Extreme condition	E-UTRA operating band groups [Note 4]	Minimum Io	Maximum Io
dB	dB		dBm/15kHz [Note 3]	$dBm/BW_{Channel}$
±2.5	±5.5	FS3_G	-118	-50
±4.5	±7.5	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by $\Delta>0$, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSSI measurement is defined from -100 dBm to -25 dBm with 1 dBm resolution.

The mapping of measured quantity is defined in Table 9.11.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.11.1.3-2: RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RSSI_00	RSSI < -100	dBm
RSSI_01	-100 ≤ RSSI < -99	dBm
RSSI_02	-99 ≤ RSSI < -98	dBm
…	…	…
RSSI_74	-27 ≤ RSSI < -26	dBm
RSSI_75	-26 ≤ RSSI < -25	dBm
RSSI_76	-25 ≤ RSSI	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.5 and A.9.11.1.

9.11.1.4 Test description

9.11.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by the UE for the CA configuration under test as defined in TS 36.521-1 [10] clause 5.4.2A. The allowed bandwidths for each cell are shown in Table 9.11.1.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.45 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X2 (without faders on active cells and without using neighbours) for UE supporting 4Rx RF band on any of the CC.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.11.1.4.3.
4. Both cells in the test are in different bands. Cell 1 is the serving FDD cell and Cell 2 is the target FS3 cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.11.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.11.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check RSSI reported value in periodical MeasurementReport messages. The RSSI value reported by the UE is compared to the actual RSSI value according to Table 9.11.1.5-2. If the UE fails to report the measurement value, the number of failed iterations is increased by one.
10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.11.1.4.3-1: Common Exception messages for average RSSI accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.9-1 Table H.3.9-2 Table H.3.9-3

Table 9.11.1.4.3-2: *MeasResults*: Additional average RSSI accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultForRSSI-r13 SEQUENCE {			
rssi-Result-r13	RSSI-Range-r13	Set according to specific test	
}			
}			

9.11.1.5 Test requirement

Table 9.11.1.5-1 defines the primary level settings including test tolerances for all tests.

The average RSSI accuracy shall meet the reported values test requirements in table 9.11.1.5-2.

Table 9.11.1.5-1: Average RSSI accuracy Test Parameters

Parameter	Unit	Test 1	
		Cell 1	Cell 2
E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	5 10 20	20
Listen before talk model		Not applicable	Not used
Measurement bandwidth	n_{PRB}	6	
PDSCH Reference measurement channel defined in A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	R0.FS3
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	R0.FS3
OCNG Patterns defined in D.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	OP.13 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0
N_{oc} in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-106
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-83
$\hat{E}_s / I_{ot}$ in subframes not corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	2.5
$\hat{E}_s / I_{ot}$ in subframes corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	-Infinity
RSRP in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-103.5	-103.5
RSRP in subframes corresponding to RSSI measurement time configuration (RMTC)		-103.5	-Infinity
Io in subframes corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-52.21
Io in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-70.77

Propagation condition	-	AWGN

Table 9.11.1.5-2: Average RSSI accuracy requirements for the reported values

Normal Conditions	Test 1	
Lowest reported value (Freq 2)	Bands FS3_G	RSSI_44
Highest reported value (Freq 2)	Bands FS3_G	RSSI_53
Extreme Conditions	**Test 1**	
Lowest reported value (Freq 2)	Bands FS3_G	RSSI_41
Highest reported value (Freq 2)	Bands FS3_G	RSSI_56
Note 1: E-UTRA operating band groups are as defined in Section 3.5.		

Table 9.11.1.5-3: Average RSSI RMTC and DMTC parameters

measDuration-r13	sym14
rmtc-Period-r13	ms40
rmtc-SubframeOffset-r13	20
ReportInterval	ms120
dmtc-PeriodOffset-r12	ms40-r12 value 0

For the test to pass, the ratio of successful reported values shall be more than 90% with a confidence level of 95%.

9.11.2 FS3 average RSSI accuracy case (PCell using TDD)

9.11.2.1 Test purpose

To verify that the average RSSI measurement accuracy is within the specified limits for all FS3 bands.

9.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 13 onwards supporting Downlink LAA and RSSI reporting. Applicability requires support for rssi-AndChannelOccupancyReporting-r13.

9.11.2.3 Minimum conformance requirements

Same as in clause 9.11.1.3

9.11.2.4 Test description

9.11.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by the UE for the CA configuration under test as defined in TS 36.521-1 [10] clause 5.4.2A. The allowed bandwidths for each cell are shown in Table 9.11.2.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.45 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X2 (without faders on active cells and without using neighbours) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.11.2.4.3.

4. Both cells in the test are in different bands. Cell 1 is the serving TDD cell and Cell 2 is the target FS3 cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.11.2.4.2 Test procedure

Same as in clause 9.11.1.4.2

9.11.2.4.3 Message contents

Same as in clause 9.11.1.4.3

9.11.2.5 Test requirement

Table 9.11.2.5-1 defines the primary level settings including test tolerances for all tests.

The average RSSI accuracy shall meet the reported values test requirements in table 9.11.2.5-2.

Table 9.11.2.5-1: Average RSSI accuracy Test Parameters

Parameter	Unit	Test 1	
		Cell 1	Cell 2
E-UTRA RF Channel Number		1	2
$BW_{channel}$	MHz	5 10 20	20
Listen before talk model		Not applicable	Not used
Measurement bandwidth	n_{PRB}	6	
PDSCH Reference measurement channel defined in A.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	R0.FS3
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	R0.FS3
OCNG Patterns defined in D.2 and D.1		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	OP.13 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0
N_{oc} in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-106
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-83
$\hat{E}_s / I_{ot}$ in subframes not corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	2.5
$\hat{E}_s / I_{ot}$ in subframes corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	-Infinity
RSRP in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-103.5	-103.5
RSRP in subframes corresponding to RSSI measurement time configuration (RMTC)		-103.5	-Infinity
Io in subframes corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-52.21
Io in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-70.77
Propagation condition	-	AWGN	

Table 9.11.2.5-2: Average RSSI accuracy requirements for the reported values

Normal Conditions	Test 1	
Lowest reported value (Freq 2)	Bands FS3_G	RSSI_44
Highest reported value (Freq 2)	Bands FS3_G	RSSI_53
Extreme Conditions	**Test 1**	
Lowest reported value (Freq 2)	Bands FS3_G	RSSI_41
Highest reported value (Freq 2)	Bands FS3_G	RSSI_56
Note 1: E-UTRA operating band groups are as defined in Section 3.5.		

Table 9.11.2.5-3: Average RSSI RMTC and DMTC parameters

measDuration-r13	sym14
rmtc-Period-r13	ms40
rmtc-SubframeOffset-r13	20
ReportInterval	ms120
dmtc-PeriodOffset-r12	ms40-r12 value 0

For the test to pass, the ratio of successful reported values shall be more than 90% with a confidence level of 95%.

9.12 Channel Occupancy

9.12.1 FS3 channel occupancy test (PCell using FDD)

9.12.1.1 Test purpose

To verify that the Channel Occupancy measurement is within the specified limits for all FS3 bands.

9.12.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 13 onwards supporting Downlink LAA and rssi-AndChannelOccupancyReporting-r13.

9.12.1.3 Minimum conformance requirements

The absolute accuracy of RSSI measurements is defined as the RSSI measurements from a FS3 cell in CA operation with a serving FDD or TDD cell.

The accuracy requirements are valid under the following conditions:

- All symbols during each RSSI measurement duration are available for RSSI sampling within the same reporting interval,
- RSSI at the UE receiver meets the following condition with respect to the configured *channelOccupancyThreshold* [5]:

  RSSI at the UE receiver is below *channelOccupancyThreshold*- Δ_{RSSI} , or

  RSSI at the UE receiver is above *channelOccupancyThreshold*+ Δ_{RSSI} ,

  where Δ_{RSSI} is the applicable RSSI measurement accuracy value from the RSSI measurement accuracy requirements specified in TS 36.133 [4] Section 9.1.18.6.2.

The nominal reported *channelOccupancy* shall be 33. At least 89% of channel occupancy reports made by the UE shall indicate this value

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.6 and A.9.12.1.

9.12.1.4 Test description

9.12.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by the UE for the CA configuration under test as defined in TS 36.521-1 [10] clause 5.4.2A. The allowed bandwidths for each cell are shown in Table 9.12.1.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.45 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X2 (without faders on active cells and without using neighbours) for UE supporting 4Rx RF band on any of the CC.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.12.1.4.3.
4. Both cells in the test are in different bands. Cell 1 is the serving FDD cell and Cell 2 is the target FS3 cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.12.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.12.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check channel occupancy reported value in periodical MeasurementReport messages. The channel occupancy reported by the UE is compared to the actual channel occupancy value defined in clause 9.12.1.5. If the UE fails to report the measurement value, the number of failed iterations is increased by one.
10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.12.1.4.3 Message contents

Same as clause 9.11.1.4.3 with the following exceptions:

Table 9.12.1.4.3-2: *MeasResults*: Additional Channel occupancy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultForRSSI-r13 SEQUENCE {			
rssi-Result-r13	RSSI-Range-r13	Set according to specific test	
channelOccupancy-r13	INTEGER	Set according to specific test	
}			
}			

9.12.1.5 Test requirement

Table 9.12.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 9.12.1.5-1: Channel occupancy Test Parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	
E-UTRA RF Channel Number		1	2	
$BW_{channel}$	MHz	5 10 20	20	
Listen before talk model		Not applicable	Not used	
Measurement bandwidth	n_{PRB}	6		
PDSCH Reference measurement channel defined in A.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	R0.FS3	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	R0.FS3	
OCNG Patterns defined in D.1		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	OP.13 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0	
N_{oc} in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-106	
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 = 2 (Note 2)	dBm/15 kHz	-106	NC	-89.41
			EC	-86.41
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 is not equal to 2 (Note 2)	dBm/15 kHz	-106	NC	-98.17
			EC	-101.17
$\hat{E}_s/I_{ot}$ in subframes not corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	2.5	
$\hat{E}_s/I_{ot}$ in subframes corresponding to RSSI measurement time configuration (RMTC)	dB	2.5	-Infinity	
RSRP in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-103.5	-103.5	

RSRP in subframes corresponding to RSSI measurement time configuration (RMTC)		-103.5	-Infinity	
Io in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 = 2 (Note 2)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	NC	-58.62
			EC	-55.62
Io in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 is not equal to 2 (Note 2)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	NC	-67,38
			EC	-70,38
Io in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-70.77	
Propagation condition	-	AWGN		
channelOccupancyThreshold	dBm	-63		
NOTE 1: NC and EC refer to Normal Conditions and Extreme Conditions. NOTE 2: Accumulated system frame number is used to avoid a configuration not match test purpose in boundary of hyper frame numbers.				

Table 9.12.1.5-2: Channel occupancy RMTC and DMTC parameters

measDuration-r13	sym14
rmtc-Period-r13	ms40
rmtc-SubframeOffset-r13	20
ReportInterval	ms120
dmtc-PeriodOffset-r12	ms40-r12 value 0

The nominal reported *channelOccupancy* shall be 33. For the test to pass, the ratio of successful reported values shall be more than 90% with a confidence level of 95%.

9.12.2 FS3 channel occupancy test (PCell using TDD)

9.12.2.1 Test purpose

To verify that the Channel Occupancy measurement is within the specified limits for all FS3 bands.

9.12.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 13 onwards supporting Downlink LAA and rssi-AndChannelOccupancyReporting-r13.

9.12.2.3 Minimum conformance requirements

Same as in clause 9.12.1.3

9.12.2.4 Test description

9.12.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by the UE for the CA configuration under test as defined in TS 36.521-1 [10] clause 5.4.2A. The allowed bandwidths for each cell are shown in Table 9.12.2.5-1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.45 for UE supporting only 2Rx RF bands on all CC and Annex A, Figure A.X2 (without faders on active cells and without using neighbours) for UE supporting 4Rx RF band on any of the CC.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.12.2.4.3.

4. Both cells in the test are in different bands. Cell 1 is the serving TDD cell and Cell 2 is the target FS3 cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.12.2.4.2 Test procedure

Same as in clause 9.12.1.4.2

9.12.2.4.3 Message contents

Same as in clause 9.12.1.4.3

9.12.2.5 Test requirement

Table 9.12.2.5-1 defines the primary level settings including test tolerances for all tests.

Table 9.12.2.5-1: Channel occupancy Test Parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	
E-UTRA RF Channel Number		1	2	
$BW_{channel}$	MHz	5 10 20	20	
Listen before talk model		Not applicable	Not used	
Measurement bandwidth	n_{PRB}	6		
PDSCH Reference measurement channel defined in A.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	R0.FS3	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	R0.FS3	
OCNG Patterns defined in D.2 and D.1		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	OP.13 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0	
N_{oc} in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-106	-106	
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 = 2 (Note 2)	dBm/15 kHz	-106	NC	-89.41
			EC	-86.41
N_{oc} in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 is not equal to 2 (Note2)	dBm/15 kHz	-106	NC	-98.17
			EC	-101.17
$\hat{E}_s / I_{ot}$ in subframes not corresponding to RSSI measurement time configuration (RMT)	dB	2.5	2.5	

$\hat{E}_s/I_{ot}$ in subframes corresponding to RSSI measurement time configuration (RMTC	dB	2.5	-Infinity	
RSRP in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/15 kHz	-103.5	-103.5	
RSRP in subframes corresponding to RSSI measurement time configuration (RMTC)		-103.5	-Infinity	
Io in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 = 2 (Note 2)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	NC	-58.62
			EC	-55.62
Io in subframes corresponding to RSSI measurement time configuration (RMTC) where system frame number mod 12 is not equal to 2 (Note)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	NC	-67,38
			EC	-70,38
Io in subframes not corresponding to RSSI measurement time configuration (RMTC)	dBm/4.5 MHz dBm/9 MHz dBm/18 MHz	-76.79 -73.78 -70.77	-70.77	
Propagation condition	-	AWGN		
channelOccupancyThreshold	dBm	-63		
NOTE 1: NC and EC refer to Normal Conditions and Extreme Conditions. NOTE 2: Accumulated system frame number is used to avoid a configuration not match test purpose in boundary of hyper frame numbers.				

Table 9.12.2.5-2: Channel occupancy RMTC and DMTC parameters

measDuration-r13	sym14
rmtc-Period-r13	ms40
rmtc-SubframeOffset-r13	20
ReportInterval	ms120
dmtc-PeriodOffset-r12	ms40-r12 value 0

The nominal reported *channelOccupancy* shall be 33. For the test to pass, the ratio of successful reported values shall be more than 90% with a confidence level of 95%.

10 Proximity-based Services in Any Cell Selection

10.1 FFS

10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

10.2.1 Test purpose

To verify the ProSe UE's ability to initiate and cease SLSS transmissions during cell selection state and if the UE meets the maximum evaluation time.

10.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

10.2.3 Minimum conformance requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.84 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.84 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.8 sec (clause 11.3.2) for the parameters in this test;

SLSS period is set as 40ms in this test.

The normative reference for this requirement is TS 36.133 [4] clause 11.3, and A.10.2.

10.2.4 Test description

10.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 10.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 10.2.4.3.
5. There no active cells in this test case during the actual test loop, and SS is expected to simulate a reference UE, SyncRef UE 1. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 10.2.4.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		None	
Active SyncRef UE		SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration		As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC	dBm/15 kHz	-95	
T1	s	3	
T2	s	5.24	
T3	s	5.24	

Table 10.2.4.1-2: SyncRef UE specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1) Note resource pool is same as Configuration #2 used by ProSe UE.		
syncOffsetIndicator		Set same as *syncOffsetIndicator1* in ProSe Direct Communication preconfiguration		
slssid		30		
inCoverage		TRUE		
networkControlledSyncTx		ON		
N_{oc} Note1	dBm/15 kHz	-96		
$\hat{E}_s / N_{oc}$	dB	5.5	-3.5	5.5
S-RSRP Note2, Note3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.

Note 4: This test is according to the principle defined in section A.3.12.3.

10.2.4.2 Test procedure

There are no active cells in this test. There is one active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every synchronization period Prior to start of test, test system is required to ensure that the ProSe UE is synchronized to the SyncRef UE 1 and is transmitting SLSS + MIB-SL as derived from the SLSS + MIB-SL of SyncRef. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the S-RSRP of SyncRef UE 1 is above *syncTxThreshOOC* and the UE is not expected to be transmitting SLSS. During T2, the S-RSRP of SyncRef UE 1 is lowered below *syncTxThreshOOC* and the UE is expected to initiate SLSS transmissions. During T3, the S-RSRP of SyncRef UE 1 is increased back to be above *syncTxThreshOOC* and the UE is expected to cease SLSS transmissions.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode E is activated on a EUTRA cell.

2. EUTRA cell is powered down for the remaining duration of the test case. SS would ensure that it enables a SyncRefUE1 at this stage and the ProSe UE under test is synchronized to SyncRefUE1.
3. Set the parameters according to T1 in Table 10.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
4. During T1, SS checks if the UE is not transmitting SLSS.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 10.2.5-1.
6. UE is expected to initiate a SLSS transmissions inside 0.84 s from the start of T2. If the UE initiates SLSS transmission consider the loop to be pass, else the loop is considered as fail.
7. After the SS is able to measure the SLSS in step 6) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 10.2.5-1
8. UE is expected to cease SLSS transmission inside 0.84s from the start of T3. If the UE ceases SLSS transmission consider the loop to be pass, else the loop is considered as fail.
9. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode E activated according to TS 36.508 [7] clause 4.5.4.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved for both the events.

10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 10.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

10.2.5 Test requirement

Tables 10.2.4.1-2 and 10.2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 10.2.5-1: SyncRef UE specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1) Note resource pool is same as Configuration #2 used by ProSe UE.		
syncOffsetIndicator		Set same as *syncOffsetIndicator1* in ProSe Direct Communication preconfiguration		
slssid		30		
inCoverage		TRUE		
networkControlledSyncTx		ON		

N_{oc} Note1	dBm/15 kHz	-96		
$\hat{E}_s / N_{oc}$	dB	6.1	-4.1	6.1
S-RSRP Note2, Note3	dBm/15 kHz	-89.9	-100.1	-89.9
Propagation Condition		AWGN		

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.
Note 4: This test is according to the principle defined in section A.3.12.3.

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.84 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.84 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.8 sec (clause 11.3.2) for the parameters in this test;

SLSS period is set as 40ms in this test.

10.3 FFS

10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

10.4.1 Test purpose

The purpose of this test is to verify cell identification delay requirement for a newly detectable cell on the downlink frequency associated with the pre-configured ProSe carrier frequency in Any Cell Selection.

10.4.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

10.4.3 Minimum conformance requirements

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier is defined as the time from the beginning of T2 to the time UE camps on the cell and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier shall be less than 7.68 s.

The cell selection delay can be expressed as $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON} + T_{SI}$, where

- $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON}$ = 6.4sec as specified in sub-clause 11.4.2.2
- T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case

This gives a total of 7.68 sec.

The normative reference for this requirement is TS 36.133 [4] clause 11.4, and A.10.4.

10.4.4 Test description

10.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 10.4.4.1-2.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 10.4.4.3.
5. There is one active cell (Cell 1) and active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every SLSS period (40ms).

Table 10.4.4.1-1: Test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter		Unit	Value	Comment
Initial condition	Active synchronization source		Sync Ref UE 1	
Final condition	Active synchronization source		Cell1	
E-UTRA RF Channel Number			1	
Channel Bandwidth ($BW_{channel}$)		MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell			Cell1	
Active SyncRef UEs			SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration			As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC			11 (+infinity)	
T1		s	2	
T2		s	30	

Table 10.4.4.1-2: Cell specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$ Note 4	MHz	5 or 10	
OCNG Patterns defined in A.3.2.1.2 Note 4		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note 1			
OCNG_RB Note 1			
N_{oc} Note2	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	-infinity	-3
RSRP Note3	dBm/15 kHz	-infinity	-101
SCH_RP Note3	dBm/15 kHz	-infinity	-101
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This test is according to the principle defined in section A.3.12.3.

Table 10.4.4.1-3: SyncRef UE specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1	
		T1	T2
E-UTRA RF Channel Number		1 (Uplink)	
$BW_{channel}$ Note 4	MHz	5 or 10	
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1)	
networkControlledSyncTx		ON	
slssid		30	
inCoverage (in MIB-SL)		TRUE	
syncOffsetIndicator		syncOffsetIndicator1	
N_{oc} Note1	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	13	
S-RSRP Note2, Note3	dBm/15 kHz	-85	
Propagation Condition		AWGN	

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.
Note 4: This test is according to the principle defined in section A.3.12.3.

10.4.4.2 Test procedure

There is one active cell (Cell 1) and active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every SLSS period (40ms). The test consists of two successive time periods, with time duration of T1 and T2 respectively. During T1, the cell is powered OFF and the ProSe UE is synchronized to SyncRef UE 1. During T2, the cell is powered ON and the ProSe UE will detect the cell and attempt to camp on the cell.

1 Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode D is activated.

2. Set the parameters according to T1 in Table 10.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.

3. At the start of T1, cell 1 is powered off and UE is expected to synchronize with SyncRefUE1.Also TE is expected to verify that UE is able to transmit SLSS + MIB-SL before the end of T1.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 10.4.5-1.

4. UE is expected to initiate PRACH preambles inside 7.68 s from the start of T2. If the UE sends PRACH inside 7.68s consider the loop to be pass, else UE fails the iteration.

5. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

6. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode 4 activated according to TS 36.508 [7] clause 4.5.4.

7. Repeat step 2-6 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

10.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 10.4.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

10.4.5 Test requirement

Tables 10.4.4.1-1 and 10.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 10.4.5-1: Cell specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Cell 1	
		T1	T2

E-UTRA RF Channel Number		1	
$BW_{channel}$ Note 4	MHz	5 or 10	
OCNG Patterns defined in A.3.2.1.2 Note 4		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note 1			
OCNG_RB Note 1			
N_{oc} Note2	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	-infinity	-2.4
RSRP Note3	dBm/15 kHz	-infinity	-100.4
SCH_RP Note3	dBm/15 kHz	-infinity	-100.4
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This test is according to the principle defined in section A.3.12.3.

Table 10.4.5-2: SyncRef UE specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1	
		T1	T2
E-UTRA RF Channel Number		1 (Uplink)	
$BW_{channel}$ Note 4	MHz	5 or 10	
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1)	
networkControlledSyncTx		ON	
slssid		30	
inCoverage (in MIB-SL)		TRUE	
syncOffsetIndicator		syncOffsetIndicator1	
N_{oc} Note1	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	13	
S-RSRP Note2, Note3	dBm/15 kHz	-85	
Propagation Condition		AWGN	

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.
Note 4: This test is according to the principle defined in section A.3.12.3.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier is defined as the time from the beginning of T2 to the time UE camps on the cell and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier shall be less than 7.68 s.

The cell selection delay can be expressed as $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON} + T_{SI}$, where

- $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON}$ = 6.4sec as specified in sub-clause 11.4.2.2
- T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case

This gives a total of 7.68 sec.

11 V2V Sidelink Communication for V2V Operation on Dedicated V2V Carrier

11.1 V2V UE Transmission Timing Accuracy Test

11.1.1 Test purpose

To verify the timing requirement for V2V sidelink transmissions by UE transmitting PSSCH and PSCCH.

11.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 14 and forward that support V2X communication and is capable of V2X sidelink communication..

11.1.3 Minimum conformance requirements

For this test, the UE is triggered by the test loop function to transmit for V2V sidelink Communication.

There is one GNSS based synchronization source during the test. The test system can emulate and send the GNSS signal to the test UE.

The transmit timing accuracy is verified by the UE transmitting PSSCH and PSCCH.

UE is not expected to receive any configuration related to V2V sidelink communication from the serving cell.

The requirement are applicable when the reference timing used by the UE for V2V communication is derived from GNSS signals.

The sidelink transmissions takes place $(N_{\mathrm{TA,SL}} + N_{\mathrm{TA\,offset}}) \cdot T_{\mathrm{s}}$ before the subframe starting boundary derived from subclause 5.10.14 of TS 36.331 [5], where $N_{\mathrm{TA\,offset}} = 0$ and $N_{\mathrm{TA,SL}} = 0$. The transmission timing error for sidelink transmissions shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified as $12*T_s$ and T_s is the basic timing unit defined in TS 36.211 [9].

The normative reference for this requirement is TS 36.133 [4] clause 12.2 and A.11.1

11.1.4 Test description

11.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 11.1.4.1-1.

1. Connect the SS, the GNSS simulator and the AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2V sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 11.1.4.3.
3. The GNSS simulator is configured for Scenario #1: static in Geographical area #1, as defined in TS 36.508 [7] Table 4.11.2-2. Geographical area #1 is also pre-configured in the UE.
4. The V2X reference measurement channel is set according to Table 11.1.4.1-1.
5. Propagation conditions are set according to Annex B.0.
6. Ensure the UE is in State 5A-V2X according to TS 36.508 [7] clause 4.5.9.
7. The GNSS simulator is triggered to start step 1 of Scenario #1 to simulate a location in the centre of Geographical area #1. Wait for the UE to acquire the GNSS signal and start to transmit.

Table 11.1.4.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for V2V

Parameter	Unit	Value	Comment
RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	10	Band 47 TDD
V2V SL Communication preconfiguration		Defined in Table A.3.21.2-1	
PSCCH Reference Measurement Channel		Defined in Table A.3.21.3-1	
PSSCH Reference Measurement Channel		Defined in Table A.3.21.3-2	
Propagation condition		AWGN	

11.1.4.2 Test procedure

For this test, the UE is triggered by the test loop function to transmit for V2V sidelink Communication. The transmit timing accuracy is verified by the UE transmitting PSSCH and PSCCH. UE is not expected to receive any configuration related to V2V sidelink communication from the serving cell.

1. UE transmit V2X sidelink communication data over the PC5 inteface in according to SL-V2X-Preconfiguration and to schedule the V2X RMC for PSCCH and PSSCH according to Table 11.1.4.1-1.
2. After the UE is synchronized to the GNSS synchronization source, the test system shall verify that the UE PSSCH and PSCCH transmission timing offset is within the timing error specified in clause 11.1.5 with respect to the GNSS reference time in the GNSS simulator.

11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 11.1.4.3-0: +CCUTLE (Initial condition)

Derivation Path: 36.508 Table 4.7I-2: +CCUTLE, condition Close and Transmit

Table 11.1.4.3-1: *SL-V2X-PreconfigFreqInfo-r14 configuration for PSSCH/PSCCH* for TX/RX resource pool

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {	SL-V2X-PreconfigCommPool-r14-DEFAULT with following exceptions		
sl-OffsetIndicator-r14	0		
startRB-PSCCH-Pool-r14	0		
Sl-subframe-r14 CHOICE {			
Bl100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
}			
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {	SL-V2X-PreconfigCommPool-r14-DEFAULT with following exceptions		
sl-OffsetIndicator-r14	0		
startRB-PSCCH-Pool-r14	0		
Sl-subframe-r14 CHOICE {			
Bl100-r14	10000000000000000000 10000000000000000000 10000000000000000000 10000000000000000000 10000000000000000000		
}			
}			
}			
}			

11.1.5 Test requirement

Test Parameters for UE Transmit Timing Accuracy are specified in Table 11.1.4.1-1.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA,SL}} + N_{\mathrm{TA\,offset}}) \cdot T_s$.

The UE transmit timing offset for V2V sidelink transmission shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified as $15*T_s$ and T_s is the basic timing unit defined in TS 36.211 [9]. The timing accuracy is verified by using PSSCH and PSCCH transmissions.

The following sequence of events shall be used to verify that the requirements are met:

- After the UE is synchronized to the GNSS synchronization source, the test system shall verify that the UE PSSCH and PSCCH transmission timing offset is within the specified timing error with respect to the GNSS reference time in the GNSS simulator.

11.2 Interruptions due to V2V sidelink communication

11.2.1 Test purpose

To verify interruptions due to V2V sidelink communication.

11.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 14 and forward that support V2V Communication.

11.2.3 Minimum conformance requirements

This clause contains interruption requirements for the UE capable of V2V sidelink communication under the following additional conditions:

- the UE is pre-configured with parameters for enabling the UE to acquire timing synchronization
- the UE has dedicated transmitter chain and dedicated receiver chain for the V2V operation
- the UE supports independent concurrent E-UTRAN operation in an E-UTRA band and stand-alone V2V sidelink operation.

The UE shall not cause any interruption on the serving cell when receiving or transmitting V2V sidelink communication signals.

The normative reference for this requirement is TS 36.133 [4] clause 12.3 and A.11.2

11.2.4 Test description

11.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 11.2.4.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2V sidelink transmission are pre-configured according to TS 36.508 [7] subclause 6.8.2. Message content exceptions are defined in sub-clause 11.2.4.3.
3. The V2X reference measurement channel is set according to Table 11.2.4.1-1.
4. Propagation conditions are set according to Annex B.0

Table 11.2.4.1-1: Test parameters for interruptions due to V2V slide link communication

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	RF channel 1 is serving RF channel 2 is non-serving
Channel Bandwidth ($BW_{channel}$)	MHz	10	On both Band 47 and E-UTRA band
Active cell		Cell 1	Serving cell on RF channel number 1

Table 11.2.4.1-2: Slidelink communication configuration for interruptions due to V2V

Parameter	Unit	Value	Comment
RF Channel Number		2	Band 47
Channel Bandwidth ($BW_{channel}$)	MHz	10	According to principle defined in TS 36.133 [4] clause A.3.12.3
V2V slidelink communication resource pool configuration		As specified in Table A.3.21.3-1	IE values unless specified otherwise in this test. (Preconfigured)
PSCCH Reference Measurement Channel		CC.1 TDD	As specified in Table A.3.21.4.1-1
PSSCH Reference Measurement Channel		CD.1 TDD	As specified in Table A.3.21.4.1-2

11.2.4.2 Test procedure

In the test, the UE under test is configured with PCell on a serving frequency in the E-UTRA band, and is pre-configured with V2V sidelink communication resources for a non-serving frequency in Band 47. The test consists of one active serving cell (cell 1) on the serving RF channel 1, and there is no active cell on RF channel 2. There is no other UE in the test. UE is not expected to receive any configuration related to V2V sidelink communication from the serving cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2
2. Set the parameters according to RF channel 1 in Tables 11.2.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. Trigger the UE to active UE test loop mode (Note: The activation of UE test loop mode may be performed by MMI or AT command (+CATM).)
4. Trigger UE to close UE test loop mode E. (Note: Closing of UE test loop mode E may be performed by MMI or AT command (+CCUTLE))
5. The UE starts to perform the V2X sidelink communication according to SL-V2X-Preconfiguration
6. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Table 11.2.5-1 on PCell.
7. The test system shall verify that no interruption is caused to the ACK/NACKs on the serving cell on RF channel 1 during the test.

11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 11.2.4.3-0: AT COMMAND: +CATM (Step 3)

Derivation Path: Table 4.7I-1: +CATM with condition Activation

Table 11.2.4.3-1: +CCUTLE (Step 4)

Derivation Path: 36.508 Table 4.7I-2: +CCUTLE, condition Close and Transmit

11.2.5 Test requirement

Tables 11.2.4.1-1, 11.2.4.1-2, and 11.2.5-1 define the primary level settings including test tolerances for interruptions due to V2V sidelink communication test.

Table 11.2.5-1: Cell specific test parameters for interruptions due to V2V slidelink communication

Parameter	Unit	Cell1
RF Channel Number		1
Serving/Non-serving		Serving
$BW_{channel}$ Note 5	MHz	10
Correlation Matrix and Antenna Configuration		1x2 Low
drx-Configuration		None
PDCCH/PCFICH/PHICH Reference measurement channel Note1, Note 5		R.6 FDD
PDSCH Reference measurement channel defined in A.3.1.1.1 Note1, Note 5		R.3 FDD
OCNG Pattern defined in A.3.2.1		OP.10 FDD
PCFICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note1	dB	
OCNG_RB Note1	dB	
$\hat{E}_s / N_{oc}$	dB	16
N_{oc}	dBm/15 kHz	-98
RSRP Note4	dBm/15 kHz	-82
SCH_RP Note 4	dBm/15 kHz	-82
Propagation condition		AWGN

Note 1: For the reference measurement channels, see clause A.3.1.
Note 2: For the OCNG pattern, see clause A.3.2.
Note 3: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: This test is according to the principle defined in section A.3.12.3.

The test system shall verify that no interruption is caused to the ACK/NACKs on the serving cell on RF channel 1 during the test.

12 V2X Communications

This clause contains timing accuracy requirements for the sidelink physical channels specified for V2X Sidelink Communication.

12.1 V2X UE Transmission Timing Accuracy Test

12.1.1 V2X UE Transmission Timing Accuracy Test for eNB as Timing Reference

12.1.1.1 Test Purpose

The purpose of this test is to verify the timing requirements for V2X sidelink transmissions specified in clause 13.2.2, when the downlink timing of the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED) on a non-V2X sidelink

carrier is used as timing reference. For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X sidelink communication.

12.1.1.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2x communications, Band 47 and any EUTRA band.

12.1.1.3 Minimum Conformance Requirements

For parameters specified in Tables 12.1.1.4.1-1 and 12.1.1.5.1-1, the timing accuracy for V2X sidelink transmission shall takes place $(N_{\text{TA, SL}} + N_{\text{TA offset}}) \cdot T_{\text{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{\text{TA offset}} = 0$ and $N_{\text{TA,SL}} = 0$. The timing accuracy is verified by using PSSCH transmissions.

12.1.1.4 Test Description

12.1.1.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.1.1.4.1-1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.1.1.4.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.1.1.4.3.
3. Void
4. The V2X reference measurement channel is set according to Table 12.1.1.4.1-1.
5. Propagation conditions are set according to Annex B.0.
6. Ensure the UE is in State 5A-V2X according to TS 36.508 [7] clause 4.5.9.

Table 12.1.1.4.1-1: V2XSidelink Test Parameters for V2X UE Transmit Timing Accuracy Test for eNB as Timing Reference

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Band 47 TDD
Channel Bandwidth ($BW_{channel}$)	MHz	10	
V2X sidelink communication configuration		As specified in Table A.12.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
PSCCH Reference Measurement Channel		CC.1A	Defined in Table A.12.3-1
PSSCH Reference Measurement Channel		CD.1A	Defined in Table A.12.3-2
Propagation condition		AWGN	

Table 12.1.1.4.1-2: Void

12.1.1.4.2 Test Procedure

For this test, the UE is triggered by the test loop function to transmit for V2X sidelink Communication. There is one active cell (PCell) in this test. The transmit timing accuracy is verified by the UE transmitting PSCCH.

1. UE transmits V2X sidelink communication data over the PC5 interface in according to SL-V2X-Preconfiguration and to schedule the V2X RMC for PSCCH and PSSCH according to Table 12.1.1.4.1-1.

2. After the UE is synchronized to the EUTRA, the test system shall verify that the UE PSCCH transmission timing offset is within ± 15×Ts with respect to the downlink EUTRA signal.

12.1.1.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.1.1.4.3-1: *SL-V2X-InterFreqUE-Config-r14-DEFAULT* for typeTxsync-r14

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
typeTxSync-r14	*Set according to the specific test configuration*	ENUMERATED {gnss, enb}	
}			

Table 12.1.1.4.3-2: *SL-CommResourcePoolV2X-r14-DEFAULT for*

Derivation Path: 36.508 Table 4.6.3-20C			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-CommResourcePoolV2X-r14-DEFAULT ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
BI100-r14	11111111 11111111 0000		
}			
sizeSubchannel-r14	n50		BW10
numSubchannel-r14	n1		
startRB-PSCCH-Pool-r14	0		
threshS-RSSI-CBR-r14	NotPresent		
restrictResourceReservationPeriod-r14	NotPresent		
}			

12.1.1.5 Test Requirement

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus place $(N_{\text{TA, SL}} + N_{\text{TA offset}}) \cdot T_s$ where $N_{\text{TA offset}} = 0$ and $N_{\text{TA,SL}} = 0$

The timing accuracy for V2V sidelink transmission shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified as $15*T_s$ and T_s is the basic timing unit defined in TS 36.211 [9]. The timing accuracy is verified by using PSCCH transmissions.

Table 12.1.1.5.1-1: Cell Test parameters for V2X UE Transmit Timing Accuracy Test for eNB as Timing Reference

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		2	FDD band
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 2
CP length of Cell 1		Normal	
PDCCH/PCFICH/PHICH Reference measurement channel Note1		R.6 FDD	
OCNG Pattern Note2		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA Note3			
OCNG_RB Note3			
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s / N_{oc}$	dB	3.3	
RSRP Note4	dBm/15 kHz	-94.7	
SCH_RP Note 4	dBm/15 kHz	-94.7	
Propagation condition		AWGN	

Note 1: For the reference measurement channels, see clause A.3.1.
Note 2: For the OCNG pattern, see clause A.3.2.
Note 3: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

12.1.2 V2X UE Transmission Timing Accuracy Test for SyncRef UE as Timing Reference

12.1.2.1 Test Purpose

The purpose of this test is to verify the timing requirements for V2X sidelink transmissions specified in clause 13.2.3, when SyncRef UE is used as timing reference. For this test, the UE is triggered by the test loop function to transmit for V2X sidelink communication.

12.1.2.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2x communications, Band 47 and any EUTRA band.

12.1.2.3 Minimum Conformance Requirements

For parameters specified in Tables 12.1.2.5.1-1, the timing accuracy for V2X sidelink transmission shall takes place before the reception of the first detected path (in time) of the corresponding timing reference frame from the SyncRef UE, where = 0 and .. The timing accuracy is verified by using PSSCH transmissions.

12.1.2.4 Test Description

12.1.2.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.1.1.4.1-1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.1.2.5.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port, as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.1.2.4.3.
3. Void
4. The V2X reference measurement channel is set according to Table 12.1.2.5.1-1.
5. Propagation conditions are set according to Annex B.0
6. Ensure the UE is in State 5A-V2X according to TS 36.508 [7] clause 4.5.9.

Table 12.1.2.4.1-1: Void

12.1.2.4.2 Test Procedure

For this test, the UE is triggered by the test loop function to transmit for V2X sidelink Communication. There is one active SyncRef UE in this test without either serving cell or GNSS signals. Before the test starts, the UE has been synchronized to the SyncRef UE. The transmit timing accuracy is verified by the UE transmitting PSCCH.

1. UE transmits V2X sidelink communication data over the PC5 interface in according to SL-V2X-Preconfiguration and to schedule the V2X RMC for PSCCH and PSSCH according to Table 12.1.2.5.1-1.

2. After the UE is synchronized to the EUTRA, the test system shall verify that the UE PSCCH transmission timing offset is within ± 15×Ts with respect to the downlink EUTRA signal.

12.1.2.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.1.2.4.3-1: *SL-V2X-InterFreqUE-Config-r14-DEFAULT* for typeTxsync-r14

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
typeTxSync-r14	*Set according to the specific test configuration*	ENUMERATED {gnss, enb}	
}			

Table 12.1.2.4.3-2: *SL-CommResourcePoolV2X-r14-DEFAULT for*

Derivation Path: 36.508 Table 4.6.3-20C			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-CommResourcePoolV2X-r14-DEFAULT ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
BI100-r14	11111111 11111111 0000		
}			
sizeSubchannel-r14	n50		BW10
numSubchannel-r14	n1		
startRB-PSCCH-Pool-r14	0		
threshS-RSSI-CBR-r14	NotPresent		
restrictResourceReservationPeriod-r14	NotPresent		
}			

12.1.2.5 Test Requirement

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus place $(N_{\text{TA, SL}} + N_{\text{TA offset}}) \cdot T_s$ where $N_{\text{TA offset}} = 0$ and $N_{\text{TA,SL}} = 0$

The timing accuracy for V2V sidelink transmission shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified as $15*T_s$ and T_s is the basic timing unit defined in TS 36.211 [9]. The timing accuracy is verified by using PSCCH transmissions.

Table 12.1.2.5.1-1: Test parameters for V2X UE Transmit Timing Accuracy Test for SyncRef UE as Timing Reference

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	Band 47 TDD
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Active cell			None	
Active SyncRef UE			SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
V2X sidelink communication configuration			As specified in Table A.12.2-2 (Configuration #1)	IE values unless specified otherwise in this test.
PSCCH Reference Measurement Channel			CC.1A	Defined in Table A.12.3-1
PSSCH Reference Measurement Channel			CD.1A	Defined in Table A.12.3-2
N_{oc}		dBm/15 kHz	-98	
SyncRef UE 1	syncCP-Len		Normal	
	syncOffsetIndicator		3	
	slssid		30	
	inCoverage		TRUE	In MIB-SL
	networkControlledSyncTx		ON	
	V2X sidelink communication resource pool configuration		As specified in Table A.12.2-2 (Configuration #2)	IE values unless specified otherwise in this test; Note resource pool is same as Configuration #1 used by V2X UE.
	$\hat{E}_s / N_{oc}$		3.3	
	S-RSRP Note1, Note 2		-94.7	
Propagation condition			AWGN	
Note 1: S-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 2: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.				

12.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication

12.2.1 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for eNB as Timing Reference

12.2.1.1 Test purpose

To verify the V2X UE meets the requirements related to the maximum evaluation time allowed to initiate and cease SLSS transmissions defined in TS 36.133 [4] clause 13.3.1.1, when the downlink timing of the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED) on a non-V2X sidelink carrier is used as timing reference.

12.2.1.2 Test applicability

This test applies to all types of E-UTRA UE release 14 and forward that support V2X Communication and SLSS transmission.

12.2.1.3 Minimum conformance requirements

The requirements apply when the Serving cell / PCell is used as synchronization reference source and when the UE is

- out of coverage on the V2X sidelink carrier and in-coverage with a serving cell on a non-V2X sidelink carrier,

and when the conditions for SLSS transmissions specified in [5] are met; *networkControlledSyncTx* is not configured; and *syncTxThreshIC* is included in *SystemInformationBlockType21*. The UE shall be capable of measuring the RSRP of the cell used as synchronization reference source to evaluate to initiate/cease SLSS transmissions within $T_{evaluate,SLSS}$

where,

- $T_{evaluate,SLSS}$ = 0.4 seconds when UE is not configured with DRX.
- $T_{evaluate,SLSS}$ = as specified in Table 12.2.1.3-1 when UE is configured with DRX.

Table 12.2.1.3-1: $T_{evaluate,SLSS}$ with V2X sidelink communication

DRX cycle length [s]	$T_{evaluate,SLSS}$ [s] (number of DRX cycles)
≤0.04	0.4 (Note 1)
0.04<DRX-cycle≤2.56	Note 2 (6)
Note1: Number of DRX cycles depends upon the DRX cycle in use Note2: Time depends upon the DRX cycles in use	

If higher layer filtering is configured, an additional delay in evaluation to initiate/cease SLSS transmissions can be expected.

For the cell as synchronization reference source:

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.5.1 for a corresponding Band are fulfilled,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band are fulfilled.

The normative reference for this requirement is TS 36.133 [4] clause 13.3.1.1 and A.12.2.1.

12.2.1.4 Test description

12.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz for E-UTRA Cell, largest supported V2X channel bandwidth.

1. Connect the SS (node B and SS-V2X-UE emulator) and AWGN noise sources to the UE antenna connectors using TS 36.508 [7] Annex A, Figure A.93a as appropriate.
2. The E-UTRA Cell 1 is powered OFF. Ensure the UE is in State5A-V2X in Transmit Mode according to TS 36.508 [7] clause 4.5.9.
3. Turn on the Cell 1. The general test parameter settings are set up according to Table 12.2.1.4.1-1.
4. Propagation conditions are set according to Annex B clauses B.0.
5. Message contents are defined in clause 12.2.1.4.3.
6. Cell1 is serving Cell on the E-UTRA RF channel 1, and is used for connection setup with the power levels set according to Annex C.0 and C.1.
7. Ensure the UE is in State 3A-RF-V2X on the E-UTRA RF channel 1 according to TS 36.508 [7] clause 7.2A.3C.

Table 12.2.1.4.1-1: Test Parameters for Initiation/Cease of SLSS Transmissions Test for eNB as Timing Reference

Parameter	Unit	Value	Comment
Active cell		Cell 1	Serving cell on RF channel number 1
Active SyncRef UE		SyncRef UE 1	Transmitting SLSS+MIB-SL on RF channel number 2 (TDD carrier in Band 47)
V2X sidelink Communication configuration		As specified in TS 36.133 [4] Table A.3.24.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
networkControlledSyncTx		Not configured	
syncTxThreshIC	dBm/15 kHz	-110	In SIB21
DRX		OFF	
T1	s	3	
T2	s	5.24	
T3	s	5.24	

12.2.1.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, E-UTRA RF channel 1 is used for E-UTRA Cell 1, and E-UTRA RF channel 2 is used for V2X communication.

1. Set the parameters according to T1 in Table 12.2.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
2. When T1 expires, set the parameters according to T2 in Table 12.2.1.5-1. T2 starts.
3. If the SLSS transmission is received by the SS with an overall delay measured from the beginning of time period T2 less than 0.56s, the number of success for the event "Initiation" is increased by one. Otherwise, count a fail for the event "Initiation" and go to step 6.
4. When T2 expires, set the parameters according to T3 in Table 12.2.1.5-1. T3 starts.
5. If the last SLSS transmission is received by the SS with an overall delay measured from the beginning of time period T3 less than 0.56s, the number of success for the event "Cease" is increased by one. Otherwise, count a fail for the event "Cease".
6. When T3 expires, or a fail was counted for the event “Initiation” in step 3, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

7. Set Cell 1 physical cell identity = ((current cell 1 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

8. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-RF-V2X according to TS 36.508 [7] clause 7.2A.3C.
   or
   - switches off and on the UE and ensures the UE is in State 5A-V2X in Transmit Mode according to TS 36.508 [7] clause 4.5.9, then in State 3A-RF-V2X according to TS 36.508 [7] clause 7.2A.3C.

9. Repeat steps 1-8 until a test verdict has been achieved.

Each of the events “Initiation” and “Cease” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

12.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 12.2.1.4.3-1: Common Exception messages for Initiation/Cease of SLSS Transmissions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 12.2.1.4.3-2: *SL-InterFreqInfoV2X-r14-DEFAULT:* Initiation/Cease of SLSS Transmissions

Derivation Path: 36.508 Table 4.6.3-20E			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-InterFreqInfoV2X-r14-DEFAULT ::= SEQUENCE {			
v2x-SchedulingPool-r14	Not present		
v2x-UE-ConfigList-r14 SEQUENCE {			
SL-V2X-InterFreqUE-Config-r14[1] SEQUENCE {			
physCellIdList-r14	Not present		
typeTxSync-r14	enb		
v2x-SyncConfig-r14 SEQUENCE {	Not present		
SL-SyncConfigNFreq-r13[1] SEQUENCE {			
asyncParameters-r13 SEQUENCE {			
syncCP-Len-r13	normal		
syncOffsetIndicator-r13	0		
slssid-r13	50		
}			
txParameters-r13 SEQUENCE {			
syncTxParameters-r13			
alpha-r12	al0		
p0-r12	31		
}			
syncTxThreshIC-r13	4	-110dBm	
syncInfoReserved-r13	Not present		
syncTxPeriodic-r13	Not present		
}			
rxParameters-r13	Not present		
syncOffsetIndicator-v1430	0		
gnss-Sync-r14	Not present		
}			
}			
v2x-CommRxPool-r14 SEQUENCE {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	Not present		
rxParametersNCell-r14	Not present		
dataTxParameters-r14	Not present		
zoneID-r14	Not present		
threshS-RSSI-CBR-r14	Not present		
poolReportId-r14	Not present		
cbr-pssch-TxConfigList-r14	Not present		
resourceSelectionConfigP2X-r14	Not present		
syncAllowed-r14	Not present		
restrictResourceReservationPeriod-r14	Not present		
}			
}			
v2x-CommTxPoolNormal-r14 SEQUENCE {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111110000		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	Not present		

rxParametersNCell-r14	Not present		
dataTxParameters-r14 SEQUENCE{			
alpha-r12	al0		
p0-r12	31		
}			
zoneID-r14	Not present		
threshS-RSSI-CBR-r14	Not present		
poolReportId-r14	Not present		
cbr-pssch-TxConfigList-r14	Not present		
resourceSelectionConfigP2X-r14	Not present		
syncAllowed-r14	Not present		
restrictResourceReservationPeriod-r14	Not present		
}			
}			
p2x-CommTxPoolNormal-r14	Not present		
v2x-CommTxPoolExceptional-r14 SEQUENCE{			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	00000000000000001111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	Not present		
rxParametersNCell-r14	Not present		
dataTxParameters-r14 SEQUENCE{			
alpha-r12	al0		
p0-r12	31		
}			
zoneID-r14	Not present		
threshS-RSSI-CBR-r14	Not present		
poolReportId-r14	Not present		
cbr-pssch-TxConfigList-r14	Not present		
resourceSelectionConfigP2X-r14	Not present		
syncAllowed-r14	Not present		
restrictResourceReservationPeriod-r14	Not present		
}			
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14-DEFAULT		
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14-DEFAULT		
thresPSSCH-RSRP-List-r14 SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14 {			
SL-ThresPSSCH-RSRP-r14[n]	1	For n=1,2,…,64, where n denotes the index for the threshold used for sensing based UE autonomous resource selection	
}			
restrictResourceReservationPeriod-r14 SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF SL-RestrictResourceReservationPeriod-r14 {			
SL-RestrictResourceReservationPeriod-r14[1]	v0dot2		
SL-RestrictResourceReservationPeriod-r14[2]	v0dot5		
SL-RestrictResourceReservationPeriod-r14[3]	v1		
SL-RestrictResourceReservationPeriod-r14[4]	v2		
SL-RestrictResourceReservationPeriod-r14[5]	v3		
SL-RestrictResourceReservationPeriod-r14[6]	v4		
SL-RestrictResourceReservationPeriod-r14[7]	v5		
SL-RestrictResourceReservationPeriod-r14[8]	v6		
SL-RestrictResourceReservationPeriod-r14[9]	v7		
SL-RestrictResourceReservationPeriod-r14[10]	v8		

SL-RestrictResourceReservationPeriod-r14[11]	v9		
SL-RestrictResourceReservationPeriod-r14[12]	v10		
}			
probResourceKeep-r14	v0		
p2x-SensingConfig-r14	Not present		
sl-ReselectAfter-r14	Not present		
}			
zoneConfig-r14	Not present		
offsetDFN-r14	Not present		
}			
}			
}			

12.2.1.5 Test requirement

Table 12.2.1.5-1 defines the primary level settings including test tolerances for Initiation/Cease of SLSS Transmissions Test for eNB as Timing Reference.

Table 12.2.1.5-1: Cell Test Parameters for Initiation/Cease of SLSS Transmissions Test for eNB as Timing Reference

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		
OCNG Patterns defined in A.3.2.1.2		OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-110		
$\hat{E}_s / N_{oc}$	dB	5.6	-5.6	5.6
RSRP Note3	dBm/15 kHz	-104.4	-115.6	-104.4
SCH_RP Note 3	dBm/15 kHz	-104.4	-115.6	-104.4
Io Note 3	dBm/9 MHz	-75.56	-81.16	-75.56
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.56 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.56 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.4 sec (clause 13.3.1.1) for the parameters in this test;

SLSS period is set as 160ms in this test.

All of the above test requirements shall be fulfilled in order for the of SLSS transmission initiation and cease delay to be counted as correct. The rate of correct observed SLSS transmission initiation and SLSS transmission cease delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for initiation and cease.

Decide the test pass, if initiation and cease are passed, otherwise fail the UE.

12.2.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for SyncRef UE as Timing Reference

12.2.2.1 Test purpose

To verify the requirements related to the evaluation time allowed to initiate and cease SLSS transmissions defined in clause 13.3.1.3, when SyncRef UE is used as timing reference.

12.2.2.2 Test applicability

This test applies to all types of UE that support V2X Communication and Band 47 and SLSS transmission.

12.2.2.3 Minimum conformance requirements

The requirements apply when SyncRef UE is used as synchronization reference source and when the UE is

- in any cell selection state, or
- out of coverage on the V2X sidelink carrier and is associated with a serving cell on a non-V2X sidelink carrier,

and when the conditions for SLSS transmissions specified in [5] are met and when SyncRef UE is used as synchronization reference source and if *syncTxThreshOoC* is included in the preconfigured V2X parameters.

The UE shall be capable of measuring the S-RSRP of the selected SyncRef UE used as synchronization reference source and evaluate it to initiate/cease SLSS transmissions within $T_{evaluate,SLSS}$ = 0.64 seconds.

If higher layer filtering for S-RSRP measurements is pre-configured, an additional delay in evaluation to initiate/cease SLSS transmissions can be expected.

For the selected SyncRef UE [5] used to derive transmission timing for V2X sidelink communication:

- S-RSRP related side conditions given in TS 36.133 [4] Section 13.4 for a corresponding Band are fulfilled,
- V2X SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.6.4 for a corresponding Band are fulfilled.

The normative reference for this requirement is TS 36.133 [4] clause 13.3.1.3 and A.12.2.2.

12.2.2.4 Test description

12.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: largest supported V2X channel bandwidth.

1. Connect the SS (SS-V2X-UE emulator) and AWGN noise sources to the UE antenna connectors using TS 36.508 [7] Annex A, Figure A.92 as appropriate without GNSS simulator.
2. The parameter settings for V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in clause 12.2.2.4.3.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Ensure the UE is in State5A-V2X in Transmit Mode according to TS 36.508 [7] clause 4.5.9.

Table 12.2.2.4.1-1: Test Parameters for Initiation/Cease of SLSS Transmissions Test for SyncRef UE as Timing Reference

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	TDD carrier in Band 47 is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		None	
Active SyncRef UE		SyncRef UE 1	Transmitting SLSS+MIB-SL on RF channel number 1
V2X sidelink Communication preconfiguration		As specified in Table A.3.24.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
syncTxThreshOoC	dBm/15 kHz	-100	
T1	s	3	
T2	s	5.24	
T3	s	5.24	

12.2.2.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, E-UTRA RF channel 1 is used for E-UTRA Cell 1, and E-UTRA RF channel 2 is used for V2X communication.

1. Set the parameters according to T1 in Table 12.2.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. Wait for 2s for UE to get synchronized to the SyncRef UE.
2. Set the parameters according to T2 in Table 12.2.2.5-1. Wait for 2s for UE to start transmission of SLSS derived from the SLSS+MIB-SL of SyncRef UE.
3. Set the parameters according to T1 in Table 12.2.2.5-1. T1 starts. The UE stops
4. When T1 expires, set the parameters according to T2 in Table 12.2.2.5-1. T2 starts.
5. If the SLSS transmission is received by the SS with an overall delay measured from the beginning of time period T2 less than 0.8s, the number of success for the event “Initiation” is increased by one. Otherwise, count a fail for the event “Initiation” and go to step 8.
6. When T2 expires, set the parameters according to T3 in Table 12.2.2.5-1. T3 starts.
7. If the last SLSS transmission is received by the SS with an overall delay measured from the beginning of time period T3 less than 0.8s, the number of success for the event “Cease” is increased by one. Otherwise, count a fail for the event “Cease”.
8. Repeat steps 1-7 until a test verdict has been achieved.

Each of the events “Initiation” and “Cease” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

12.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.10 with the following exceptions:

Table 12.2.2.4.3-1: *SL-V2X-PreconfigFreqInfo-r14-DEFAULT:* Initiation/Cease of SLSS Transmissions

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommPreconfigSync-r14 SEQUENCE {			
syncOffsetIndicators-r14	0		
syncTxParameters-r14	31		
syncTxThreshOoC-r14	2	-100dBm	
filterCoefficient-r14	fc0		
syncRefMinHyst-r14	dB0		
syncRefDiffHyst-r14	dB0		
}			
v2x-CommRxPoolList-r14 SEQUENCE {			
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n5		
numSubchannel-r14	n10		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	Not present		
dataTxParameters-r14	Not present		
zoneID-r14	Not present		
threshS-RSSI-CBR-r14	Not present		
cbr-pssch-TxConfigList-r14	Not present		
resourceSelectionConfigP2X-r14	Not present		
syncAllowed-r14	Not present		
restrictResourceReservationPeriod-r14	Not present		
}			
}			
v2x-CommTxPoolList-r14 SEQUENCE {			
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n5		
numSubchannel-r14	n10		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	Not present		
dataTxParameters-r14	Not present		
alpha-r12	al0		
p0-r12	31		
}			
zoneID-r14	Not present		
threshS-RSSI-CBR-r14	Not present		
cbr-pssch-TxConfigList-r14	Not present		
resourceSelectionConfigP2X-r14	Not present		
syncAllowed-r14	Not present		
restrictResourceReservationPeriod-r14	Not present		
}			
}			
}			

12.2.2.5 Test requirement

Table 12.2.2.5-1 defines the primary level settings including test tolerances for Initiation/Cease of SLSS Transmissions Test for eNB as Timing Reference.

Table 12.2.2.5-1: SyncRef UE Specific Test Parameters for Initiation/Cease of SLSS Transmissions Test for SyncRef UE as Timing Reference

Parameter	Unit	SyncRef UE 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
V2X sidelink Communication resource pool configuration		As specified in Table A.3.24.2-1 (Configuration #1) Note resource pool is same as Configuration #1 used by V2X UE.		
syncOffsetIndicator		Set same as *syncOffsetIndicator1* in V2X sidelink Communication preconfiguration		
slssid		30		
inCoverage		TRUE		
networkControlledSyncTx		ON		
N_{oc} Note1	dBm/15 kHz	-102.6		
PSBCH $\hat{E}_s / N_{oc}$	dB	8.7	-3.5	8.7
S-RSRP Note2, Note3	dBm/15 kHz	-93.9	-106.1	-93.9
Io	dBm/9MHz	-74.78	-82.42	-74.78
Propagation Condition		AWGN		

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: S-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: SSSS Es/Noc and PSSS Es/Noc are set the same as PSBCH Es/Noc.

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.8 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.8 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.64 sec (clause 13.3.1.3) for the parameters in this test;

SLSS period is set as 160ms in this test.

All of the above test requirements shall be fulfilled in order for the of SLSS transmission initiation and cease delay to be counted as correct. The rate of correct observed SLSS transmission initiation and SLSS transmission cease delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for initiation and cease.

Decide the test pass, if initiation and cease are passed, otherwise fail the UE.

12.3 V2X Synchronization Reference Selection/Reselection Tests

12.3.1 V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority

12.3.1.1 Test Purpose

The purpose of this test is to verify the requirements related to SyncRef UE selection / reselection defined in TS 36.133 [4] clause 13.4, when GNSS is configured as the highest priority. For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication.

12.3.1.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2X communications, Band 47 and any EUTRA band.

12.3.1.3 Minimum Conformance Requirements

The requirements defined in section TS 36.133 [4] 13.4 do not apply to the UEs that do not support transmission and reception of SLSS.

A V2X SyncRef UE is considered to be detectable when

- S-RSRP related side conditions given in TS 36.133 [4] Section 9.10.2 are fulfilled for a corresponding Band,
- V2X SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.6.4 for a corresponding Band are fulfilled.

When GNSS synchronization reference source is configured as the highest priority and

- UE is synchronized to GNSS directly,
  - UE shall not drop any V2X SLSS and data transmission for the purpose of selection/reselection to the SyncRef UE.
- UE is synchronized to a SyncRef UE that is synchronized to GNSS directly or in-directly,
  - UE shall not drop any V2X data transmission for the purpose of selection/reselection to the SyncRef UE. The UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within $T_{detect,SyncRef\ UE\_V2X}$ seconds if the V2X SyncRef UE meets the selection / reselection criterion defined in TS 36.331 [2]. $T_{detect,SyncRef\ UE\_V2X}$ is defined as 1.6 seconds at SCH Es/Iot $\geq$0 dB, provided that the UE is allowed to drop a maximum of 30% of its SLSS transmissions during $T_{detect,SyncRef\ UE\_V2X}$ for the purpose of selection / reselection to the SyncRef UE.
- in other case
  - The UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within $T_{detect,SyncRef\ UE\_V2X}$ seconds if the SyncRef UE meets the selection / reselection criterion defined in TS 36.331 [2]. $T_{detect,SyncRef\ UE\_V2X}$ is defined as 8 seconds at SCH Es/Iot $\geq$0 dB, provided that the UE is allowed to drop a maximum of 6% of its V2X data and SLSS transmissions during $T_{detect,SyncRef\ UE\_V2X}$ for the purpose of selection / reselection to the SyncRef UE. UE is allowed to drop up to 2 subframes of its V2X data reception per PSBCH monitoring occasion and overall drop rate shall not exceed 0.3% of its V2X data reception during $T_{detect,SyncRef\ UE\_V2X}$ for the purpose of selection / reselection to the SyncRef UE.

UE shall be capable of performing S-RSRP measurements for 3 identified intra-frequency V2X SyncRef UE with the measurement period of 320 ms. It is assumed that the V2X SyncRef UE do not drop or delay any SLSS transmission within the measurement period. Otherwise, the measurement period may be extended.

12.3.1.4 Test Description

12.3.1.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.3.1.4.1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.3.1.4.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.3.1.4.3.
3. The V2X reference measurement channel is set according to Table 12.3.1.4.1-1.
4. Propagation conditions are set according to Annex B.0.
5. There are one active cell (PCell) and two active SyncRef UEs (SyncRef UE 1 and SyncRef UE 2) in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.
6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2C. In addition to the default system information messages, SystemInformationBlockType21 is broadcasted according to TS 36.508 [7] Table 4.4.3.3-19.

Table 12.3.1.4.1-1: Test Parameters for V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority

Parameter		Unit	Value	Comment
Initial condition	Active synchronization source		Cell 1	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 30 and in-coverage set as TRUE in MIB-SL.
T2 end condition	Active synchronization source		Sync Ref UE 1	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 168 and in-coverage set as FALSE in MIB-SL.
Final condition	Active synchronization source		Sync Ref UE 2	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 0 and in-coverage set as FALSE in MIB-SL.
Active SyncRef UEs			SyncRef UE 1 SyncRef UE 2	Transmitting SLSS+MIB-SL on RF channel number 1 (TDD carrier in Band 47)
Active cell			Cell 1	E-UTRA FDD Cell 1 on RF channel number 2
Timing offset between SyncRef UE 1 and SyncRef UE 2		us	3	Synchronous
Frequency offset of SyncRef UE 1		ppm	0	
Frequency offset of SyncRef UE 2		ppm	5	
V2X sidelink Communication preconfiguration			As specified in Table A.12.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncPriority			*gnss*	
slssid			*30*	
syncTxThreshIC			+infinity	
T1		s	24	
T2		s	16	
T3		s	3.2	

12.3.1.4.2 Test Procedure

For this test, the UE is triggered by the test loop function to transmit for V2X sidelink Communication. There are no GNSS signals in this test. There are one active cell (PCell) and two active SyncRef UEs (SyncRef UE 1 and SyncRef UE 2) in this test. The test system shall emulate SyncRef UE 1 and SyncRef UE 2 to transmit SLSS and MIB-SL every SLSS period.

1. Trigger UE to close UE test loop back mode E (Transmit Mode). Closing of UE test loop mode E may be performed by MMI or AT command (+CCUTLE).

2. Set the parameters according to T1 in Table 12.3.1.5-1 and 12.3.1.5-2. Propagation conditions are set according to Annex B clauses B.1. T1 starts.

3. During T1, UE is expected to transmit SLSS+MIB-SL with SLSS ID = 30 and in-coverage set as TRUE in MIB-SL. If the UE performs SLSS transmission with expected contents consider the loop to be pass, else the loop is considered as fail.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 12.3.1.5-1 and 12.3.1.5-2.

5. During T2, if

   1) The V2X UE transmits SLSS+MIB-SL with SLSS ID = 168 and in-coverage set as FALSE in MIB-SL inside 8.8s from the start of T2; and

   2) The V2X UE does not drop or delay more than 6% of its V2X data and SLSS transmissions during the duration of T2

   consider the loop to be pass, else the loop is considered as fail.

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 12.3.1.5-1 and 12.3.1.5-2.

7. During T3, if

   1) The V2X UE transmits SLSS+MIB-SL with SLSS ID = 0 and in-coverage set as FALSE in MIB-SL inside 2.4s from the start of T3; and

   2) The V2X UE does not drop or delay more than 30% of its SLSS transmissions during the duration of T3

   consider the loop to be pass, else the loop is considered as fail.

8. When T3 expires, the SS switches off and on the UE and ensures the UE is in 3A-RF with test loop mode E (Transmit Mode) activated according to TS 36.508 [7] clause 5.2A.2C.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved for all the three events.

12.3.1.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.3.1.4.3-1: SystemInformationBlockType21 (initial condition)

Derivation Path: 36.508 Table 4.4.3.3-19			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType21-r14 ::= SEQUENCE {			
sl-V2X-ConfigCommon-r14 SEQUENCE {			
typeTxSync-r14	gnss	ENUMERATED {gnss, enb, ue, spare1}	
}			
}			

Table 12.3.1.4.3-2: SL-V2X-PreconfigFreqInfo-r14-DEFAULT

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommPreconfigSync-r14 SEQUENCE {			
syncOffsetIndicators-r14 SEQUENCE {	0		
syncOffsetIndicator1-r14	1	Indicates the offset of the first subframe of a resource pool within a SFN cycle	
syncOffsetIndicator2-r14	2	Indicates the offset of the first subframe of a resource pool within a SFN cycle	
}			
syncTxParametes-r14			
syncTxThreshOoc-r14	11	+infinity	
filterCoefficient-r14			
syncRefMinHyst-r14			
syncRefDiffHyst-r14			
}			
v2x-CommRxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {			
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14-DEFAULT		
zoneConfig-r14	Not present		
syncPriority-r14	enb		
thresSL-TxPrioritization-r14	Not present		
offsetDFN-r14	Not present		
}			

Table 12.3.1.4.3-3: SL-V2X-PreconfigCommPool-r14 (Table 12.3.1.4.3-2)

Derivation Path: 36.508 Table 4.6.3-20J			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true	BOOLEAN	
sizeSubchannel-r14	n5		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
}			

Table 12.3.1.4.3-4: SL-V2X-InterFreqUE-Config-r14-DEFAULT (V2X UE and SyncRef UE 2)

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPool-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	1111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
}			
}			
v2x-CommTxPoolNormal-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111110000		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
}			
v2x-CommTxPoolExceptional-r14 SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	00000000000000001111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
v2x-ResourceSelectionConfig-r14 SEQUENCE {			
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14-DEFAULT		
restrictResourceReservationPeriod-r14 SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF SL-RestrictResourceReservationPeriod-r14 {			
SL-RestrictResourceReservationPeriod-r14[1]	v0dot2		
}			
probResourceKeep-r14	v0		
}			
}			

12.3.1.5 Test Requirement

Tables 12.3.1.5-1 and 12.3.1.5-2 define the primary level settings including test tolerances for V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority test.

Table 12.3.1.5-1: SyncRef UE Specific Test Parameters for V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority

Parameter	Unit	SyncRef UE 1			SyncRef UE 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	5 or 10					
V2X Sidelink Communication resource pool configuration		As specified in Table A.12.2-1 (Configuration #1)			As specified in Table A.12.2-2 (Configuration #2)		
networkControlledSyncTx		N/A			ON		
syncTxThreshOoC	dBm/15 kHz	+infinity			N/A		
slssid		0			0		
inCoverage (in MIB-SL)		FALSE			TRUE		
syncOffsetIndicator		syncOffsetIndicator2			syncOffsetIndicator1		
N_{oc} Note1	dBm/15 kHz	-95					
$\hat{E}_s / N_{oc}$	dB	-infinity	0.3	0.3	-infinity	-infinity	3.5
$\hat{E}_s / I_{ot}$	dB	-infinity	0.3	-4.8	-infinity	-infinity	0.34
S-RSRP Note2, Note 3	dBm/15 kHz	-infinity	-94.7	-94.7	-infinity	-infinity	-91.5
Propagation Condition		AWGN					

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: S-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.

Table 12.3.1.5-2: Cell Test Parameters for V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority

Parameter	Unit	Cell 1		
		T1	T2	T3

E-UTRA RF Channel Number		2		
$BW_{channel}$	MHz	10		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD		
OCNG Patterns defined in D.1.2		OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-95		
$\hat{E}_s / N_{oc}$	dB	4.5	4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-90.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-90.5	-90.5
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

1) During T2, SyncRef UE selection delay is defined as the time from the beginning of T2 to the time UE is synchronized to SyncRef UE 1 and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 1 as the synchronization source. For the test configuration, the SLSS ID will be changed to 168 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T2.

The SyncRef UE selection delay shall be less than 8.8sec. The SyncRef UE selection/reselection delay can be expressed as:

SyncRef UE selection/reselection delay = $T_{detect,SyncRef\ UE}$ + $T_{evaluate,SLSS}$ + SLSS period

Where

- $T_{detect,SyncRef\ UE}$ = 8sec (as specified in TS 36.133 [4] sub-clause 11.4)
- $T_{evaluate,SLSS}$ = 0.64 (as specified in TS 36.133 [4] sub-clause 13.3.1.3)
- SLSS period = 160ms

This gives a total of 8.8seconds.

2) During T3, SyncRef UE reselection delay is defined as the time from the beginning of T3 to the time UE changes its synchronization source from SyncRef UE 1 to SyncRef UE 2, and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 2 as the synchronization source. For the test configuration, the SLSS ID will still be 0 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T3.

The SyncRef UE reselection delay shall be less than 2.4sec. The SyncRef UE selection/reselection delay can be expressed as:

SyncRef UE selection/reselection delay = $T_{detect,SyncRef\ UE}$ + $T_{evaluate,SLSS}$ + SLSS period

Where

- $T_{detect,SyncRef\ UE}$ = 1.6sec (as specified in TS 36.133 [4] sub-clause 11.4)
- $T_{evaluate,SLSS}$ = 0.64 (as specified in TS 36.133 [4] sub-clause 13.3.1.3)
- SLSS period = 160ms

This gives a total of 2.4seconds.

The test system will verify that the V2X UE does not drop or delay more than 6% of its V2X data and SLSS transmissions during the duration of T2, and does not drop or delay more than 30% of its SLSS transmissions during the duration of T3.

The rate of correct SyncRef UE selection / reselection observed during repeated tests shall be at least 90%.

12.3.2 V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority

12.3.2.1 Test Purpose

The purpose of this test is to verify the requirements related to SyncRef UE selection / reselection defined in TS 36.133 [4] clause 11.4, when eNB is configured as the highest priority. For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication.

12.3.2.2 Applicability of requirements

The requirements in this clause are applicable to E-UTRA Release 14 UEs supporting V2X communications, Band 47 and any E-UTRA band.

12.3.2.3 Minimum Conformance Requirements

The requirements defined in TS 36.133 [4] section 13.4 do not apply to the UEs that do not support transmission and reception of SLSS.

A V2X SyncRef UE is considered to be detectable when

- S-RSRP related side conditions given in TS 36.133 [4] Section 9.10.2 are fulfilled for a corresponding Band,
- V2X SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.6.4 for a corresponding Band are fulfilled.

…

When serving cell/PCell synchronization reference source is configured as the highest priority,

- UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within $T_{detect,SyncRef\ UE\_V2X}$ seconds if the SyncRef UE meets the selection / reselection criterion defined in TS 36.331 [2]. $T_{detect,SyncRef\ UE\_V2X}$ is defined as 8 seconds at SCH Es/Iot $\geq$ 0 dB, provided that the V2X UE is allowed to drop a maximum of 6% of its V2X data and SLSS transmissions for the purpose of selection / reselection to the SyncRef UE. UE is allowed to drop up to 2 subframes of its V2X data reception per PSBCH monitoring occasion and overall drop rate shall not exceed 0.3% of its V2X data reception during $T_{detect,SyncRef\ UE\_V2X}$ for the purpose of selection / reselection to the SyncRef UE.

UE shall be capable of performing S-RSRP measurements for 3 identified intra-frequency V2X SyncRef UE with the measurement period of 320 ms. It is assumed that the V2X SyncRef UE do not drop or delay any SLSS transmission within the measurement period. Otherwise, the measurement period may be extended.

When UE is synchronized to GNSS directly, before selection / reselection of the new synchronization reference source UE shall evaluate the GNSS synchronization source reliability for at least 20 seconds before changing the synchronization reference from GNSS to another synchronization reference source. UE shall be always synchronized to GNSS directly during the evaluation of GNSS synchronization source reliability.

12.3.2.4 Test Description

12.3.2.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.3.2.4.1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.3.2.4.1-1.

1. Connect the SS, the GNSS simulator and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.3.2.4.3.
3. The GNSS simulator is configured for Scenario #1: static in Geographical area #1, as defined in TS 36.508 [7] Table 4.11.2-2. Geographical area #1 is also pre-configured in the UE.
4. The V2X reference measurement channel is set according to Table 12.3.2.4.1-1.
5. Propagation conditions are set according to Annex B.0.
6. Ensure the UE is in State 5A-V2X (transmit mode) according to TS 36.508 [7] clause 4.5.9.
7. The GNSS simulator is triggered to start step 1 of Scenario #1 to simulate a location in the centre of Geographical area #1. Wait for the UE to acquire the GNSS signal and start to transmit.

Table 12.3.2.4.1-1: Test Parameters for V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority

Parameter		Unit	Value	Comment
Initial condition	Active synchronization source		GNSS	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 0 and in-coverage set as TRUE in MIB-SL.
T2 end condition	Active synchronization source		Sync Ref UE 1	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 168+59 and in-coverage set as FALSE in MIB-SL.
Final condition	Active synchronization source		Sync Ref UE 2	UE transmits for V2X Sidelink Communication and SLSS+MIB-SL with SLSS ID = 30 and in-coverage set as FALSE in MIB-SL.
Active cell			None	
Active SyncRef UEs			SyncRef UE 1 SyncRef UE 2	Transmitting SLSS+MIB-SL on RF channel number 1
Timing offset between SyncRef UE 1 and SyncRef UE 2		ms	3	Asynchronous
Frequency offset of SyncRef UE 1		ppm	0	
Frequency offset of SyncRef UE 2		ppm	5	
V2X sidelink Communication preconfiguration			As specified in Table A.12.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
syncPriority			*enb*	
syncTxThreshOoC			11 (+infinity)	
T1		s	24	
T2		s	16	
T3		s	16	

12.3.2.4.2 Test Procedure

For this test, the UE is triggered by the test loop function to transmit for V2X sidelink Communication. There are no active cells and GNSS is reliable during the whole test. . There are two active SyncRef UEs (SyncRef UE 1 and SyncRef UE 2) in this test. The test system shall emulate SyncRef UE 1 and SyncRef UE 2 to transmit SLSS and MIB-SL every SLSS period.

1. Set the parameters according to T1 in Table 12.3.2.5-1. Propagation conditions are set according to Annex B clauses B.1. T1 starts.
2. During T1, UE is expected to transmit SLSS+MIB-SL with SLSS ID = 0 and in-coverage set as TRUE in MIB-SL. If the UE performs SLSS transmission with expected contents consider the loop to be pass, else the loop is considered as fail.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 12.3.2.5-1.
4. During T2, if

   1) The V2X UE transmits SLSS+MIB-SL with SLSS ID = 168+59 and in-coverage set as FALSE in MIB-SL inside 8.8s from the start of T2; and

   2) The V2X UE does not drop or delay more than 6% of its V2X data and SLSS transmissions during the duration of T2

   consider the loop to be pass, else the loop is considered as fail.
5. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 12.3.2.5-1.
6. During T3, if

   1) The V2X UE transmits SLSS+MIB-SL with SLSS ID = 30 and in-coverage set as FALSE in MIB-SL inside 2.4s from the start of T3; and

   2) The V2X UE does not drop or delay more than 6% of its V2X data and SLSS transmissions during the duration of T3

   consider the loop to be pass, else the loop is considered as fail.
7. When T3 expires, the SS switches off and on the UE and ensures the UE is in 5A-V2X (transmit mode) according to TS 36.508 [7] clause 4.5.9.
8. Repeat step 1-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved for all the three events.

12.3.2.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.3.2.4.3-1: SL-V2X-PreconfigFreqInfo-r14-DEFAULT

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommPreconfigSync-r14 SEQUENCE {			
syncOffsetIndicators-r14 SEQUENCE {	0		
syncOffsetIndicator1-r14	0	Indicates the offset of the first subframe of a resource pool within a SFN cycle	
syncOffsetIndicator2-r14	2	Indicates the offset of the first subframe of a resource pool within a SFN cycle	
}			
syncTxParametes-r14			
syncTxThreshOoc-r14	11	+infinity	
filterCoefficient-r14			
syncRefMinHyst-r14			
syncRefDiffHyst-r14			
}			
v2x-CommRxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {			
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14-DEFAULT		
zoneConfig-r14	Not present		
syncPriority-r14	enb		
thresSL-TxPrioritization-r14	Not present		
offsetDFN-r14	Not present		
}			

Table 12.3.2.4.3-2: SL-V2X-PreconfigCommPool-r14 (Table 12.3.1.4.3-2)

Derivation Path: 36.508 Table 4.6.3-20J			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true	BOOLEAN	
sizeSubchannel-r14	n5		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
}			

Table 12.3.2.4.3-3: SL-V2X-InterFreqUE-Config-r14-DEFAULT (SyncRef UE 2)

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPool-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
}			
}			
v2x-CommTxPoolNormal-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111110000		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
}			
v2x-CommTxPoolExceptional-r14 SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	00000000000000001111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
v2x-ResourceSelectionConfig-r14 SEQUENCE {			
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14-DEFAULT		
restrictResourceReservationPeriod-r14 SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF SL-RestrictResourceReservationPeriod-r14 {			
SL-RestrictResourceReservationPeriod-r14[1]	v0dot2		
}			
probResourceKeep-r14	v0		
}			
}			

12.3.2.5 Test Requirement

Tables 12.3.2.5-1 define the primary level settings including test tolerances for V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority test.

Table 12.3.2.5-1: SyncRef UE Specific Test Parameters for V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority

Parameter	Unit	SyncRef UE 1			SyncRef UE 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	5 or 10					
V2X Sidelink Communication resource pool configuration		As specified in Table A.12.2-1 (Configuration #1)			As specified in Table A.12.2-2 (Configuration #2)		
networkControlledSyncTx		N/A			ON		
syncTxThreshOoC	dBm/15 kHz	+infinity			N/A		
slssid		59			30		
inCoverage (in MIB-SL)		FALSE			TRUE		
syncOffsetIndicator		syncOffsetIndicator2			syncOffsetIndicator1		
N_{oc} Note1	dBm/15 kHz	-95					
$\hat{E}_s / N_{oc}$	dB	-infinity	0.3	0.3	-infinity	-infinity	3.5
$\hat{E}_s / I_{ot}$	dB	-infinity	0.3	-4.8	-infinity	-infinity	0.34
S-RSRP Note2, Note 3	dBm/15 kHz	-infinity	-94.7	-94.7	-infinity	-infinity	-91.5
Propagation Condition		AWGN					

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: S-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.

1) During T2, SyncRef UE selection delay is defined as the time from the beginning of T2 to the time UE is synchronized to SyncRef UE 1 and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 1 as the synchronization source. For the test configuration, the SLSS ID will be changed to 168+59 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T2.

The SyncRef UE selection delay shall be less than 8.8sec. The SyncRef UE selection/reselection delay can be expressed as:

SyncRef UE selection/reselection delay = $T_{detect,SyncRef\ UE} + T_{evaluate,SLSS}$ + SLSS period

Where

- $T_{detect,SyncRef\ UE}$ = 8sec (as specified in TS 36.133 [4] sub-clause 11.4)
- $T_{evaluate,SLSS}$ = 0.64 (as specified in TS 36.133 [4] sub-clause 13.3.1.3)
- SLSS period = 160ms

This gives a total of 8.8 seconds.

2) During T3, SyncRef UE reselection delay is defined as the time from the beginning of T3 to the time UE changes its synchronization source from SyncRef UE 1 to SyncRef UE 2, and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 2 as the synchronization source. For the test configuration, the SLSS ID will be changed to 30 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T3.

The SyncRef UE reselection delay shall be less than 8.8sec. The SyncRef UE selection/reselection delay can be expressed as:

SyncRef UE selection/reselection delay = $T_{detect,SyncRef\ UE}$ + $T_{evaluate,SLSS}$ + SLSS period

Where

- $T_{detect,SyncRef\ UE}$ = 8sec (as specified in TS 36.133 [4] sub-clause 11.4)
- $T_{evaluate,SLSS}$ = 0.64 (as specified in TS 36.133 [4] sub-clause 13.3.1.3)
- SLSS period = 160ms

This gives a total of 8.8 seconds.

The test system will verify that the V2X UE does not drop or delay more than 6% of its V2X data and SLSS transmissions during the duration of T2 and T3.

The rate of correct SyncRef UE selection / reselection observed during repeated tests shall be at least 90%.

12.4 Congestion Control Measurement Test for V2X UE

12.4.1 Test Purpose

To verify the V2X UE makes correct reporting of an event according to the congestion control measurement requirements in section 13.6.

The purpose of this test is to verify that the V2X UE makes correct reporting of an event. This test will verify the congestion control measurement requirements in section 13.6.

12.4.2 Test applicability

This test applies to all types of UE that support V2X Communication and Band 47 and Channel Busy Ratio measurement and reporting.

12.4.3 Minimum conformance requirements

The UE shall be capable of estimating the channel busy ratio for one or more transmission pools indicated by higher layers TS 36.331 [5], based on S-RSSI measurements provided by the physical layer.

When no sidelink transmissions occur, the UE physical layer shall perform a single-shot S-RSSI measurement for each sub-channel included in all the subframes configured as transmission pools.

The S-RSSI measurement performed according to this section shall meet the S-RSSI measurement accuracy requirements defined in TS 36.133 [4] Section 9.10.4 & Table 12.4.3.1-1

Table 12.4.3.1-1: Intra-frequency S-RSSI absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	E-UTRA V2X operating band groups Note 4	Minimum Io	Maximum Io
dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±5.5	TDD_G	-118	-50
±4.5	±7.5	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA V2X operating band groups are as defined in Section 3.5.

The UE shall perform channel busy ratio (CBR) measurement based on S-RSSI measurements as described in TS 36.214 [12].

The normative reference for this requirement is TS 36.133 [4] clause 13.6 and A.12.4

12.4.4 Test description

12.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.1.2.4.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.4.4.3.
3. Void
4. The V2X reference measurement channel is set according to Table 12.4.4.1-1.
5. Propagation conditions are set according to Annex B.0
6. There are one active cell (PCell) and 4 active SyncRef UEs in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.
7. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2C. In addition to the default system information messages, SystemInformationBlockType21 is broadcasted according to TS 36.508 [7] Table 4.4.3.3-19.

Table 12.4.4.1-1: General test parameters for Congestion Control Measurement Test for V2X UE

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	TDD carrier in Band 47
Channel Bandwidth ($BW_{channel}$)		MHz	10	
V2X sidelink communication configuration			As specified in Table TS 36.133 [4] A.3.24.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
sl-Subframe-r14 included in SL-configV2X-TxPoolList			11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
numSubchannel-r14 included in SL-configV2X-TxPoolList			1	ENUMERATED {n1}
threshS-RSSI-CBR			21	Corresponding -70dBm as defined in Section 6.3.8 in TS36.331 [5]
Number of Active Sidelink UEs every 100ms			4	Active Sidelink UE i, where i = 0, 1, 2, 3
Active Sidelink UEs	V2X sidelink Communication configuration		As specified in Table TS 36.133 [4] A.3.24.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
	sl-Subframe-r14 included in SL-configV2X-TxPoolList		10000000000000000000 00000000000000000000 00000000000000000000 00000000000000000000 00000000000000000000	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
	numSubchannel-r14 included in SL-configV2X-TxPoolList		1	ENUMERATED {n1}
	sl-OffsetIndicator-r14		i	For Active Sidelink UE i, where i = 0, 1, 2, 3
Timing offset between V2X UE and Active Sidelink UEs		µs	3	Synchronous
v1-Threshold			2	Corresponding 0.02 as defined in Section 6.3.8 in TS36.331 [5]
Hysteresis			0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	

12.4.4.2 Test procedure

There are 4 active sidelink UEs in this test. The test system shall emulate the active sidelink UE to transmit PSCCH/PSSCH every 100ms. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During T1, all of active sidelink UEs are powered off. During T2, all of active sidelink UEs are powered on and transmit PSCCH/PSSCH every 100ms.

1. Set the parameters according to T1 in Table 12.4.5-1 and 12.4.5-2. Propagation conditions are set according to Annex B clauses B.1
2. SS shall transmit an RRCConnectionReconfiguration message with Event-V1 configured.
3. The UE shall transmit RRCConnectionReconfigurationComplete message. T1 starts.
4. UE shall not send Event V1 triggered measurement report during T1.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 12.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event V1 during T2.

7. If the UE sends Event V1 triggered measurement report during T1 or UE fails to report the CBR measurement result during T2, then the number of failure tests is increased by one. Or else the number of successful tests is increased by one.

8. SS shall transmit an RRCConnectionReconfiguration message with Event-V1 removed.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

12.4.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.4.4.3-1: *SL-V2X-InterFreqUE-Config-r14-DEFAULT* for typeTxsync-r14

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
typeTxSync-r14	*gnss*	ENUMERATED {gnss, enb}	
}			

Table 12.4.4.3-2: *SL-CommResourcePoolV2X-r14-DEFAULT for*

Derivation Path: 36.508 Table 4.6.3-20C			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-CommResourcePoolV2X-r14-DEFAULT ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		UE under test
	i		Active sidelink UE i=0,1,2,3
sl-Subframe-r14 CHOICE {			
BI100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
sizeSubchannel-r14	n50		BW10
numSubchannel-r14	n1		
startRB-PSCCH-Pool-r14	0		
threshS-RSSI-CBR-r14	21	-70dBm	
restrictResourceReservationPeriod-r14	1111111111		
}			

Table 12.4.4.3-3: *SL-V2X-PreconfigFreqInfo-r14 configuration for PSSCH/PSCCH* for TX resource pool

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {	SL-V2X-PreconfigCommPool-r14-DEFAULT with following exceptions		
Bl100-r14	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111		
}			
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1] SEQUENCE {	SL-V2X-PreconfigCommPool-r14-DEFAULT with following exceptions		
Bl100-r14	10000000000000000000 00000000000000000000 00000000000000000000 00000000000000000000 00000000000000000000		
}			
}			
}			

Table 12.4.4.3-4: ReportConfigEUTRA-V1

Derivation Path: 36.508 Table 4.6.6-13			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-V1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventV1-r14 SEQUENCE {			
v1-Threshold-r14	2		
}			
}			
hysteresis	0 (0.00)		
timeToTrigger	ms0		
}			
}			
}			

12.4.5 Test requirement

Table 12.4.5-1 and 12.4.5-2 define the primary level settings including test tolerances for Congestion Control Measurement Test for V2X UE.

Table 12.4.5-1: Active sidelink UE specific test parameters for Congestion Control Measurement Test for V2X UE

Parameter	Unit	Active Sidelink UE *i* (*i* = 0, 1, 2, 3)	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PSCCH RMC (defined in A.3.24.3)		CC.1A TDD	
PSSCH RMC (defined in A.3.24.3)		CD.1A TDD	
N_{oc} Note1	dBm/15 KHz	-106	
PSCCH $\hat{E}_s / N_{oc}$	dB	4.89	14.89
PSSCH $\hat{E}_s / N_{oc}$	dB	1.89	11.89
PSSCH $\hat{E}_s / I_{ot}$ Note2	dB	1.89	11.89
PSSCH-RSRP Note 2	dBm/15 KHz	-104.11	-94.11
S-RSSI1 Note 2 Note3	dBm/1.08 MHz	-74.06	-65.90
S-RSSI2 Note 2 Note4	dBm/1.08 MHz	-78.22	-78.22
Io1 Note 2 Note4	dBm/9MHz	-74.06	-65.90
Io2 Note 2 Note6	dBm/9MHz	-78.22	-78.22
Propagation Condition	-	AWGN	

Note 1: Interference from other UEs and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: , PSSCH-RSRP, S-RSSI1, S-RSSI2, Io1 and Io2 levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: S-RSSI1 is the S-RSSI level measured on the subframe# 0 - 3 with “SFN mod 10 = 0”.

Note 4: S-RSSI2 is the S-RSSI level measured on the subframe# 4-9 with “SFN mod 10 = 0” and the subframe# 0-9 with “SFN mod 10 = 1,…, 9”.

Note 5: Io1 is the Io level measured on the subframe# 0 - 3 with “SFN mod 10 = 0”.

Note 6: Io2 is the Io level measured on the subframe# 4-9 with “SFN mod 10 = 0” and the subframe# 0-9 with “SFN mod 10 = 1,…, 9”.

Table 12.4.5-2: Cell Test Parameters for Congestion Control Measurement Test for V2X UE

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		2	
$BW_{channel}$	MHz	10	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD	
OCNG Patterns defined in A.3.2.1.2		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note 1			
OCNG_RB Note 1			
N_{oc} Note2	dBm/15 kHz	-95	
$\hat{E}_s / N_{oc}$	dB	4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-90.5
Propagation Condition			

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall not send event V1 triggered measurement reports during T1 and shall send event V1 triggered measurement reports during T2.

The rate of correct events observed during repeated tests shall be at least 98%.

12.5 Interruptions due to V2X Sidelink Communication

12.5.1 Test Purpose

The purpose of this test is to verify the requirements related to interruptions due to V2X sidelink communication defined in TS 36.133 [4] clause 13.7.1 under the following additional conditions:

- The UE is out of coverage on the V2X sidelink carrier and is associated with a serving cell on a non-V2X sidelink carrier

12.5.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2X communications, Band 47 and any EUTRA band.

12.5.3 Minimum Conformance Requirements

A UE capable of V2X sidelink communication may indicate its interest (initiation or termination) in V2X sidelink communication to the connected eNodeB using IE *SidelinkUEInformation* [2].

The UE is allowed an interruption of up to 1 subframe on the serving cell(s) during the RRC reconfiguration procedure that includes the V2X sidelink communication configuration message *sl-V2X-ConfigDedicated* [2] (setup and release). This interruption is for both uplink and downlink of the serving cell(s).

The normative reference for this requirement is TS 36.133 [4] clause 13.7 and A.12.5

12.5.4 Test Description

12.5.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.5.4.1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.5.4.1-1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.5.4.3.
3. The V2X reference measurement channel is set according to Table 12.5.4.1-1.
4. Propagation conditions are set according to Annex B.0.
5. There is one active cell (PCell) on the serving RF channel 1, and there are no active cells on RF channel 2. On RF channel 2, the test consists of 8 active Sidelink UEs in this test transmitting V2X sidelink communication.
6. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 5.2A.1A. In addition to the default system information messages, SystemInformationBlockType21 is broadcasted according to TS 36.508 [7] Table 4.4.3.3-19.

Table 12.5.4.1-1: Test Parameters for Interruptions due to V2X Sidelink Communication

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number	-	1, 2	RF channel 1 is non-V2X sidelink carrier RF channel 2 is V2X sidelink carrier
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell	-	Cell 1	PCell on RF channel number 1
CP length of Cell 1	-	Normal	
T1	s	5.12	
T2	s	Up to receiving RRC reconfiguration setup complete from the UE, or up to 2 second if UE does not transmit *SidelinkUEInformation* during this period.	
T3	s	10	

Table 12.5.4.1-2: Slidelink Communication Configuration for Interruptions due to V2X Sidelink Communication

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number		-	2	TDD carrier in Band 47
Channel Bandwidth ($BW_{channel}$)		MHz	10	
V2X sidelink Communication configuration		-	As specified in Table A.12.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
Number of Active Sidelink UEs per sc-period		-	8	Sidelink UE i = 0, .., 7
Active Sidelink UEs	V2X sidelink Communication configuration	-	As specified in Table A.12.2-2 (Configuration #2)	IE values unless specified otherwise in this test.
	PSCCH Reference Measurement Channel	-	CC.1A TDD	As specified in Table A.12.3-1
	PSSCH Reference Measurement Channel	-	CD.1A TDD	As specified in Table A.12.3-2
	numSubchannel-r14 included in v2x-CommTxPoolNormal-r14	-	1	ENUMERATED {n1}
	startRB-Subchannel-r14 included in v2x-CommTxPoolNormal-r14	-	i	For Sidelink UE i = 0, .., 7
	RSRP	dBm/15kHz	-98	

12.5.4.2 Test Procedure

For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication. On RF channel 2, the test consists of 8 active Sidelink UEs in this test transmitting V2X sidelink communication.

1. Set the parameters according to T1 in Table 12.5.5-1. Propagation conditions are set according to Annex B clauses B.1. T1 starts.
2. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 12.5.5-1. T2 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit an RRCConnectionReconfigurationComplete message.
5. During T2,
   - If the UE transmits *SidelinkUEInformation*, SS shall send *RRCConnectionReconfiguration* message with conditions SETUP and UE-SELECTED to the UE. UE shall respond with *RRCConnectionReconfigurationComplete* message. or
   - If the UE does not transmit *SidelinkUEInformation* for up to 2 second,

   T3 starts.
6. SS continuously transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Table 12.5.5-1 on PCell.
7. The test system shall verify that no interruption is caused to the ACK/NACKs on the serving cell on RF channel 1 during T3.

12.5.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.5.4.3-2: SL-V2X-InterFreqUE-Config-r14-DEFAULT (V2X UE and SyncRef UE 2)

Derivation Path: 36.508 Table 4.6.3-20I			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-InterFreqUE-Config-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPool-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111111111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	i		For Sidelink UE i=0,…,7
startRB-PSCCH-Pool-r14	0		
}			
}			
v2x-CommTxPoolNormal-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPool-r14)) OF SL-CommResourcePoolV2X-r14 {			
SL-CommResourcePoolV2X-r14[1] SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111110000		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	i		For Sidelink UE i=0,…,7
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
}			
v2x-CommTxPoolExceptional-r14 SEQUENCE {			
sl-OffsetIndicator-r14	0		
sl-Subframe-r14 CHOICE {			
bs20-r14	00000000000000001111		
}			
adjacencyPSCCH-PSSCH-r14	true		
sizeSubchannel-r14	n50		
numSubchannel-r14	n1		
startRB-Subchannel-r14	0		
startRB-PSCCH-Pool-r14	0		
dataTxParameters-r14 SEQUENCE {			
alpha-r12	al0		
p0-r12	31		
}			
}			
v2x-ResourceSelectionConfig-r14 SEQUENCE {			
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14-DEFAULT		
restrictResourceReservationPeriod-r14 SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF SL-RestrictResourceReservationPeriod-r14 {			
SL-RestrictResourceReservationPeriod-r14[1]	v0dot2		
}			
probResourceKeep-r14	v0		

}			
}			

Table 12.5.4.3-2: PCCH-Config-DEFAULT

Derivation Path: 36.508 Table 4.6.3-3			
Information Element	**Value/remark**	**Comment**	**Condition**
PCCH-Config-DEFAULT::= SEQUENCE {			
defaultPagingCycle	rf256	Typical value in real network.	
nB	OneThirtySecondT		
}			

12.5.5 Test Requirement

Tables 12.5.5-1 defines the primary level settings including test tolerances for interruptions due to V2X slidelink communication test.

Table 12.5.5-1: Cell specific test parameters for interruptions due to V2X slidelink communication

Parameter		Unit	Cell 1		
			T1	T2	T3
E-UTRA RF Channel Number		-	1		
$BW_{channel}$		MHz	10		
UE RRC state		-	IDLE	CONNECTED	
Paging configuration	defaultPagingCycle	-	rf256	N/A	
	nB	-	T/32		
DRX		-	N/A	OFF	
PDSCH Reference measurement channel defined in A.1.1 Note1, Note 4		-	N/A	None	R.3 FDD
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 Note1		-	R.6 FDD		
OCNG Pattern		-	OP.6 FDD		OP.10 FDD
PBCH_RA		dB	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note 1					
OCNG_RB Note 1					
N_{oc} Note2		dBm/15 kHz	-98		
$\hat{E}_s / N_{oc}$		dB	16		
RSRP Note3		dBm/15 kHz	-82		
SCH_RP Note 3		dBm/15 kHz	-82		
Propagation Condition		-	AWGN		
Correlation Matrix and Antenna Configuration		-	1x2 Low		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall be continuously scheduled on PCell on RF channel 1 during T3. During T3, 100% of all expected ACK/NACKs shall be transmitted by the V2X UE.

12.6 V2X UE Autonomous Resource Selection/Reselection Measurement Test

12.6.1 V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements

12.6.1.1 Test Purpose

The purpose of this test is to verify the requirements related to autonomous resource selection / reselection for V2X UE in mode 4 defined in TS 36.133 [4] clause 13.5. For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication.

12.6.1.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2X communications, Band 47 and any EUTRA band.

12.6.1.3 Minimum Conformance Requirements

The UE physical layer shall be capable of performing the PSSCH-RSRP measurements [12] on the carrier operating V2X sidelink communication for determining the subset of resources to be excluded in PSSCH resource selection in sidelink transmission mode 4. The PSSCH-RSRP measurement period corresponds to one sub-frame and the measurement shall meet the PSSCH-RSRP measurement accuracy requirement in TS 36.133 [4] Section 9.10.

The normative reference for this requirement is TS 36.133 [4] clause 13.5 and A.12.6.1

12.6.1.4 Test Description

12.6.1.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.6.1.4.1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.6.1.4.1-1.

1. Connect the SS, the GNSS simulator and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.6.1.4.3.
3. The GNSS simulator is configured for Scenario #1: static in Geographical area #1, as defined in TS 36.508 [7] Table 4.11.2-2. Geographical area #1 is also pre-configured in the UE.

4 The V2X reference measurement channel is set according to Table 12.6.1.4.1-1.

5. Propagation conditions are set according to Annex B.0.
6. Ensure the V2X UE under test is in State 5A-V2X (transmit mode) according to TS 36.508 [7] clause 4.5.9
7. The GNSS simulator is triggered to start step 1 of Scenario #1 to simulate a location in the centre of Geographical area #1. Wait for the UE to acquire the GNSS signal and start to transmit.

Table 12.6.1.4.1-1: Test Parameters for V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	TDD carrier in Band 47
Channel Bandwidth ($BW_{channel}$)		MHz	10	
V2X sidelink communication pre-configuration			As specified in Table A.12.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList			11111111111111111111	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
numSubchannel-r14 included in SL-PreconfigV2X-TxPoolList			5	Indicates the number of sub-channels for TX resource pool
minSubChannel-NumberPSSCH-r14 included in v2x-ResourceSelectionConfig-r14			1	Indicates the minimum number of sub-channels which may be used for transmissions on PSSCH
maxSubchannel-NumberPSSCH-r14 included in v2x-ResourceSelectionConfig-r14			1	Indicates the maximum number of sub-channels which may be used for transmissions on PSSCH
Number of Active Sidelink UEs			20	Active Sidelink UE i = 0, .., 19
SL-ThresPSSCH-RSRP			12	Corresponding -106 dBm as defined in Section 6.3.8 in TS36.331 [5]
Active Sidelink UEs	V2X sidelink Communication preconfiguration		As specified in Table A.12.2.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
	sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList		10000000000000000000	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
	numSubchannel-r14 included in SL-PreconfigV2X-TxPoolList		1	Indicates the number of sub-channels for TX resource pool
	startRB-Subchannel-r14 included in SL-PreconfigV2X-TxPoolList		5	Indicates the lowest RB index of the subchannel with the lowest index.
	startRB-PSCCH-Pool-r14 included in SL-PreconfigV2X-TxPoolList		5	Indicates the lowest RB index of the PSCCH pool.
	sl-OffsetIndicator-r14		i mod 20	For Active Sidelink UE i, where i = 0, .., 19
Timing offset among Active Sidelink UEs		μs	≤3	Synchronous

12.6.1.4.2 Test Procedure

For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication. There are 20 active V2X sidelink UEs in this test. Both the UE under test and active V2X sidelink UEs select GNSS as synchronization reference source. The test system can emulate and send the GNSS signal to the test UE and active V2X sidelink UEs. The test system shall emulate the active V2X sidelink UEs to transmit PSCCH/PSSCH every 20ms.

1. Set the parameters according to T1 in Table 12.6.1.5-1. Propagation conditions are set according to Annex B clauses B.1. T1 starts.

2. During T1, record the rate of PSSCH transmissions on the resources on subchannel #1. When the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved, T1 expires. If the rate of PSSCH transmissions on the resources on subchannel #1 is less than 10% consider the loop to be pass, else the loop is considered as fail.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 12.6.1.5-1.

4. During T2, record the rate of PSSCH transmissions on the resources on subchannel #1. When the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved, T2 expires. If the rate of PSSCH transmissions on the resources on subchannel #1 is more than 90% consider the loop to be pass, else the loop is considered as fail.

5. The test case is passed if step 2 and step 4 are both passed, else the test case is failed.

12.6.1.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.6.1.4.3-2: SL-V2X-PreconfigFreqInfo-r14-DEFAULT

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {			
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14-DEFAULT		
zoneConfig-r14	Not present		
syncPriority-r14	enb		
thresSL-TxPrioritization-r14	Not present		
offsetDFN-r14	Not present		
}			

Table 12.6.1.4.3-2: SL-V2X-PreconfigCommPool-r14 (Table 12.6.1.4.3-1)

Derivation Path: 36.508 Table 4.6.3-20J			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		V2X UE under test
	i mod 20		Active Sidelink UE i, where i = 0, .., 19
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111111111		V2X UE under test
	10000000000000000000		Active V2X UEs
}			
adjacencyPSCCH-PSSCH-r14	true	BOOLEAN	
sizeSubchannel-r14	n5		
numSubchannel-r14	n5		V2X UE under test
	n1		Active V2X UEs
startRB-Subchannel-r14	0		V2X UE under test
	5		Active V2X UEs
startRB-PSCCH-Pool-r14	0		V2X UE under test
	5		Active V2X UEs
}			

Table 12.6.1.4.3-3: SL-CommTxPoolSensingConfig-r14 (Table 12.6.1.4.3-1)

Derivation Path: 36.508 Table 4.6.3-20D			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-CommTxPoolSensingConfig-r14-DEFAULT ::= SEQUENCE {			
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14		
thresPSSCH-RSRP-List-r14 SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14 {			
SL-ThresPSSCH-RSRP-r14[n]	12	-106dBm For n=1,2,…,64, where n denotes the index for the threshold used for sensing based UE autonomous resource selection	
}			
probResourceKeep-r14	v0		
p2x-SensingConfig-r14	Not present		
sl-ReselectAfter-r14	Not present		
}			

Table 12.6.1.4.3-4: SL-PSSCH-TxConfig-r14 (Table 12.6.1.4.3-3)

Derivation Path: 36.508 Table 4.6.3-20F			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-PSSCH-TxConfig-r14-DEFAULT ::= SEQUENCE {			
typeTxSync-r14	gnss		
parametersAboveThres-r14 SEQUENCE {			
minSubChannel-NumberPSSCH-r14	1		
maxSubchannel-NumberPSSCH-r14	1		
}			
parametersBelowThres-r14 SEQUENCE {			
minSubChannel-NumberPSSCH-r14	1		
maxSubchannel-NumberPSSCH-r14	1		
}			
}			

12.6.1.5 Test Requirement

Tables 12.6.1.5-1 defines the primary level settings including test tolerances for V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements test.

Table 12.6.1.5-1: Active Sidelink UE Specific Test Parameters for V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements

Parameter	**Unit**	**Active Sidelink UE i (i = 0, .., 19)**	
		T1	**T2**
E-UTRA RF Channel Number	-	1	
$BW_{channel}$ Note 4	MHz	10	
PSCCH RMC (defined in A.12.3)	-	CC.1A HD	
PSSCH RMC (defined in A.12.3)	-	CD.1B HD	
OCNG pattern defined in D.4	-	VOP.1 HD	
N_{oc} Note1	dBm/15 kHz	-103	-113
PSCCH $\hat{E}_s / N_{oc}$	dB	9.1	0.9
PSSCH $\hat{E}_s / N_{oc}$	dB	6.1	-2.1
PSCCH $\hat{E}_s / I_{ot}$ Note2	dB	9.1	-0.9
PSSCH $\hat{E}_s / I_{ot}$ Note2	dB	6.1	-2.1
S-RSRP Note 2	dB	-96.9	-115.1
S-RSSI1 Note 2 Note3	dBm/0.9 MHz	-76.96	-92.52
S-RSSI2 Note 2 Note4	dBm/0.9 MHz	-61.10	-79.21
S-RSSI3 Note 2 Note5	dBm/0.9 MHz	-61.10	-79.21
Antenna Configuration	-	1x2	
Propagation Condition	-	AWGN	

Note 1: Interference from other UEs and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: Es/Iot, S-RSRP and S-RSSI levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: S-RSSI1 is the S-RSSI level measured on subchannel #1.

Note 4: S-RSSI2 is the S-RSSI level measured on subchannel #3.

Note 5: S-RSSI3 is the S-RSSI level measured on subchannel #0/2/4.

The test time T1 and T2 should be long enough. The rate of PSSCH transmissions on the resources on subchannel #1 shall be less than 10% during T1.The rate of PSSCH transmissions on the resources on subchannel #1 shall be more than 90% during T2.The rate of correct SyncRef UE selection / reselection observed during repeated tests shall be at least 90%.

12.6.2 V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements

12.6.2.1 Test Purpose

The purpose of this test is to verify the requirements related to autonomous resource selection / reselection for V2X UE in mode 4 defined in TS 36.133 [4] clause 13.5. For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication.

12.6.2.2 Applicability of requirements

The requirements in this clause are applicable to EUTRA Release 14 UEs supporting V2X communications, Band 47 and any EUTRA band.

12.6.2.3 Minimum Conformance Requirements

The UE physical layer shall be capable of performing the S-RSSI measurements [4] on the carrier operating V2X sidelink communication for determining the subset of resources to be excluded in PSSCH resource selection in sidelink transmission mode 4. The S-RSSI measurement period corresponds to 1 second and the filtered measurement shall meet the S-RSSI measurement accuracy requirement in TS 36.133 [4] Section 9.10.

The normative reference for this requirement is TS 36.133 [4] clause 13.5 and A.12.6.2

12.6.2.4 Test Description

12.6.2.4.1 Initial Conditions

Resource pool configuration for PSCCH and PSSCH reference measurement channels are set according to Table 12.6.2.4.1-1 and Annex A.12 as appropriate.

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in Table 12.6.2.4.1-1.

1. Connect the SS, the GNSS simulator and AWGN noise sources to the UE antenna connectors, connect the SS COM port to the UE COM port as shown in TS 36.508 [7] Annex A.92b.
2. The parameter settings for the V2X sidelink transmission over PC5 are pre-configured according to TS 36.508 [7] subclause 4.10.1. Message content exceptions are defined in sub-clause 12.6.2.4.3.
3. The GNSS simulator is configured for Scenario #1: static in Geographical area #1, as defined in TS 36.508 [7] Table 4.11.2-2. Geographical area #1 is also pre-configured in the UE.
4. The V2X reference measurement channel is set according to Table 12.6.2.4.1-1.
5. Propagation conditions are set according to Annex B.0.
6. Ensure the V2X UE under test is in State 5A-V2X (transmit mode) according to TS 36.508 [7] clause 4.5.9.
7. The GNSS simulator is triggered to start step 1 of Scenario #1 to simulate a location in the centre of Geographical area #1. Wait for the UE to acquire the GNSS signal and start to transmit.

Table 12.6.2.4.1-1: Test Parameters for V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	TDD carrier in Band 47
Channel Bandwidth ($BW_{channel}$)		MHz	10	
V2X sidelink communication pre-configuration			As specified in Table A.12.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList			11111111111111111111	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
numSubchannel-r14 included in SL-PreconfigV2X-TxPoolList			5	Indicates the number of sub-channels for TX resource pool
minSubChannel-NumberPSSCH-r14 included in v2x-ResourceSelectionConfig-r14			1	Indicates the minimum number of sub-channels which may be used for transmissions on PSSCH
maxSubchannel-NumberPSSCH-r14 included in v2x-ResourceSelectionConfig-r14			1	Indicates the maximum number of sub-channels which may be used for transmissions on PSSCH
Number of Active Sidelink UEs			20	Sidelink UE i = 0, .., 19
SL-ThresPSSCH-RSRP			66	Corresponding infinity dBm as defined in Section 6.3.8 in TS36.331 [5]
Active Sidelink UEs	V2X sidelink communication preconfiguration		As specified in Table A.12.2-1 (Configuration #1)	IE values unless specified otherwise in this test.
	sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList		10000000000000000000	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [8])
	numSubchannel-r14 included in SL-PreconfigV2X-TxPoolList		1	Indicates the number of sub-channels for TX resource pool
	startRB-Subchannel-r14 included in SL-PreconfigV2X-TxPoolList		5	Indicates the lowest RB index of the subchannel with the lowest index.
	startRB-PSCCH-Pool-r14 included in SL-PreconfigV2X-TxPoolList		5	Indicates the lowest RB index of the PSCCH pool.
	sl-OffsetIndicator-r14		i mod 20	For Sidelink UE i, where i = 0, .., 19
Timing offset among Active Sidelink UEs		µs	≤3	Synchronous

12.6.2.4.2 Test Procedure

For this test, the UE is triggered by the test loop function or the upper layers to transmit for V2X Sidelink Communication. There are 20 active V2X sidelink UEs in this test. Both the UE under test and active V2X sidelink UEs select GNSS as synchronization reference source. The test system can emulate and send the GNSS signal to the test UE and active V2X sidelink UEs. The test system shall emulate the active V2X sidelink UEs to transmit PSCCH/PSSCH every 20ms.

1. Set the parameters according to Table 12.6.1.5-1. Propagation conditions are set according to Annex B clauses B.1.

2. Record the rate of PSSCH transmissions on the resources on subchannel #1 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved. If the rate of PSSCH transmissions on the resources on subchannel #1 is more than 80% consider the test case to be pass, else the test case is considered as fail.

12.6.2.4.3 Message Contents

Message contents are according to TS 36.508 [7] subclause 4.6, 4.7.I and 4.10 with the following exceptions:

Table 12.6.2.4.3-2: SL-V2X-PreconfigFreqInfo-r14-DEFAULT

Derivation Path: 36.508 Table 4.6.3-20K			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigFreqInfo-r14-DEFAULT ::= SEQUENCE {			
v2x-CommRxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {	1 entry		
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-CommTxPoolList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 {			
SL-V2X-PreconfigCommPool-r14[1]	SL-V2X-PreconfigCommPool-r14		
}			
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14-DEFAULT		
zoneConfig-r14	Not present		
syncPriority-r14	enb		
thresSL-TxPrioritization-r14	Not present		
offsetDFN-r14	Not present		
}			

Table 12.6.2.4.3-2: SL-V2X-PreconfigCommPool-r14 (Table 12.6.1.4.3-1)

Derivation Path: 36.508 Table 4.6.3-20J			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0		V2X UE under test
	i mod 20		Active Sidelink UE i, where i = 0, .., 19
sl-Subframe-r14 CHOICE {			
bs20-r14	11111111111111111111		V2X UE under test
	10000000000000000000		Active V2X UEs
}			
adjacencyPSCCH-PSSCH-r14	true	BOOLEAN	
sizeSubchannel-r14	n5		
numSubchannel-r14	n5		V2X UE under test
	n1		Active V2X UEs
startRB-Subchannel-r14	0		V2X UE under test
	5		Active V2X UEs
startRB-PSCCH-Pool-r14	0		V2X UE under test
	5		Active V2X UEs
}			

Table 12.6.2.4.3-3: SL-CommTxPoolSensingConfig-r14 (Table 12.6.1.4.3-1)

Derivation Path: 36.508 Table 4.6.3-20D			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-CommTxPoolSensingConfig-r14-DEFAULT ::= SEQUENCE {			
pssch-TxConfigList-r14	SL-PSSCH-TxConfig-r14		
thresPSSCH-RSRP-List-r14 SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14 {			
SL-ThresPSSCH-RSRP-r14[n]	66	Infinity dBm. For n=1,2,…,64, where n denotes the index for the threshold used for sensing based UE autonomous resource selection	
}			
probResourceKeep-r14	v0		
p2x-SensingConfig-r14	Not present		
sl-ReselectAfter-r14	Not present		
}			

Table 12.6.2.4.3-4: SL-PSSCH-TxConfig-r14 (Table 12.6.1.4.3-3)

Derivation Path: 36.508 Table 4.6.3-20F			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-PSSCH-TxConfig-r14-DEFAULT ::= SEQUENCE {			
typeTxSync-r14	gnss		
parametersAboveThres-r14 SEQUENCE {			
minSubChannel-NumberPSSCH-r14	1		
maxSubchannel-NumberPSSCH-r14	1		
}			
parametersBelowThres-r14 SEQUENCE {			
minSubChannel-NumberPSSCH-r14	1		
maxSubchannel-NumberPSSCH-r14	1		
}			
}			

12.6.2.5 Test Requirement

Tables 12.6.2.5-1 define the primary level settings including test tolerances for V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements test.

Table 12.6.2.5-1: Active Sidelink UE Specific Test Parameters for V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements

Parameter	Unit	Active Sidelink UE i (i = 0, .., 19)
E-UTRA RF Channel Number	-	1
$BW_{channel}$ Note 4	MHz	10
PSCCH RMC (defined in A.12.3)	-	CC.1A HD
PSSCH RMC (defined in A.12.3)	-	CD.1B HD
OCNG pattern defined in D.4	-	VOP.2 TDD
N_{oc} Note1	dBm/15 kHz	-105
PSCCH $\hat{E}_s / N_{oc}$	dB	5
PSSCH $\hat{E}_s / N_{oc}$	dB	2
PSCCH $\hat{E}_s / I_{ot}$ Note2	dB	5
PSSCH $\hat{E}_s / I_{ot}$ Note2	dB	2
S-RSRP Note 2	dB	-103
S-RSSI1 Note 2 Note3	dBm/0.9 MHz	-82.15
S-RSSI2 Note 2 Note4	dBm/0.9 MHz	-76.71
S-RSSI3 Note 2 Note5	dBm/0.9 MHz	-67.18
Antenna Configuration	-	1x2
Propagation Condition	-	AWGN

Note 1: Interference from other UEs and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: Es/Iot, S-RSRP and S-RSSI levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: S-RSSI1 is the S-RSSI level measured on subchannel #1.

Note 4: S-RSSI2 is the S-RSSI level measured on subchannel #3.

Note 5: S-RSSI3 is the S-RSSI level measured on subchannel #0/2/4.

The test shall be run for a long enough amount of time. The rate of PSSCH transmissions on the resources on subchannel #1 shall be more than 80%.

Annex A (normative): Reference Measurement Channels

A.1 PDSCH

A.1.1 FDD

Table A.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value								
Reference channel		R.2 FDD		R.5 FDD	R.7 FDD	R.0 FDD	R.1 FDD	R.3 FDD	R.4 FDD	R.6 FDD
Channel bandwidth	MHz	1.4	3	5	5	10	10	10	20	20
Number of transmitter antennas		1		1	1	1	2	1	1	1
Allocated resource blocks (Note 4)		2		11	11	24	24	24	24	24
Allocated subframes per Radio Frame		10		10	10	10	10	10	10	10
Modulation		QPSK		QPSK	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Target Coding Rate		1/3		1/3	1/3	1/3	1/3	1/3	1/3	1/3
Information Bit Payload										
For Sub-Frames 4, 9	Bits	120		968	968	2088	2088	2088	2088	2088
For Sub-Frame 5	Bits	104		776	776	2088	1736	2088	2088	2088
For Sub-Frame 0	Bits	32		616	616	1736	1736	1736	1736	1736
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	968	0	0	2088	0	2088
Number of Code Blocks per Sub-Frame (Note 5)										
For Sub-Frames 4, 9		1		1	1	1	1	1	1	1
For Sub-Frame 5		1		1	1	1	1	1	1	1
For Sub-Frame 0		1		1	1	1	1	1	1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		0		0	1	0	0	1	0	1
Binary Channel Bits Per Sub-Frame										
For Sub-Frames 4, 9	Bits	456		2772	2772	6624	6336	6624	6624	6624
For Sub-Frame 5	Bits	360		2484	2484	6336	6048	6336	6336	6336
For Sub-Frame 0	Bits	176		1932	1932	5784	5520	5784	5784	5784
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	2772	0	0	6624	0	6624
Max. Throughput averaged over 1 frame	kbps	37.6		332.8	913.6	800	765	2053	800	2053

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

Table A.1.1-2: PDSCH Reference Measurement Channels for FDD with slot duration TTI

	Unit	R.8 FDD
Bandwidth	MHz	10
Number of transmit antennas		1
Allocated resource blocks(Note 4)		24
Allocated subframes per Radio Frame		10
Modulation		QPSK
Target coding rate		1/3
Information Bit Payload		
For Sub-Frame 4, 9		
Slot index 0	Bits	872
Slot index 1	Bits	1224
For Sub-Frame 5		
Slot index 0	Bits	872
Slot index 1	Bits	1224
For Sub-Frame 0		
Slot index 0	Bits	872
Slot index 1	Bits	1032
For Sub-Frame 1, 2, 3, 6, 7, 8		
Slot index 0	Bits	0
Slot index 1	Bits	0
Number of Code Blocks per slot (Note 5)		
For Sub-Frame 4, 9		
Slot index 0		1
Slot index 1		1
For Sub-Frame 5		
Slot index 0		1
Slot index 1		1
For Sub-Frame 0		
Slot index 0		1
Slot index 1		1
For Sub-Frame 1, 2, 3, 6, 7, 8		
Slot index 0		0
Slot index 1		0
Binary Channel Bits per slot		
For Sub-Frame 4, 9	Bits	
Slot index 0	Bits	2784
Slot index 1	Bits	3840
For Sub-Frame 5	Bits	
Slot index 0	Bits	2496
Slot index 1	Bits	3840
For Sub-Frame 0	Bits	
Slot index 0	Bits	2496
Slot index 1	Bits	3288
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	
Slot index 0	Bits	0
Slot index 1	Bits	0
Max. Throughput averaged over 1 frame	kbps	819.2

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: Note SPDCCH is transmitted outside allocated resource blocks

Table A.1.1-3: PDSCH Reference Measurement Channels for FDD with subslot duration TTI

	Unit	R.9 FDD
Bandwidth	MHz	10
Number of transmit antennas		1
Allocated resource blocks(Note 4)		24
Allocated subframes per Radio Frame		10
Modulation		QPSK
Target coding rate		1/3
Information Bit Payload		
For Sub-Frame 4, 9		
Subslot index 1	Bits	504
Subslot index 2	Bits	344
Subslot index 3	Bits	344
Subslot index 4	Bits	344
Subslot index 5	Bits	504
For Sub-Frame 5		
Subslot index 1	Bits	504
Subslot index 2	Bits	288
Subslot index 3	Bits	344
Subslot index 4	Bits	344
Subslot index 5	Bits	504
For Sub-Frame 0		
Subslot index 1	Bits	504
Subslot index 2	Bits	288
Subslot index 3	Bits	224
Subslot index 4	Bits	288
Subslot index 5		504
For Sub-Frame 1, 2, 3, 6, 7, 8		
Subslot index 1	Bits	0
Subslot index 2	Bits	0
Subslot index 3	Bits	0
Subslot index 4	Bits	0
Subslot index 5	Bits	0
Number of Code Blocks per Sub-Frame(Note 5)		
For Sub-Frame 4, 9		
Subslot index 1		1
Subslot index 2		1
Subslot index 3		1
Subslot index 4		1
Subslot index 5		1
For Sub-Frame 5		
Subslot index 1		1
Subslot index 2		1
Subslot index 3		1
Subslot index 4		1
Subslot index 5		1
For Sub-Frame 0		
Subslot index 1		1
Subslot index 2		1
Subslot index 3		1
Subslot index 4		1
Subslot index 5		1
For Sub-Frame 1, 2, 3, 6, 7, 8		
Subslot index 1		0
Subslot index 2		0
Subslot index 3		0
Subslot index 4		0
Subslot index 5		0
Binary Channel Bits per subslot		
For Sub-Frame 4, 9	Bits	
Subslot index 1	Bits	1632
Subslot index 2	Bits	1152
Subslot index 3	Bits	1056
Subslot index 4	Bits	1152

Subslot index 5	Bits	1632
For Sub-Frame 5	Bits	
Subslot index 1	Bits	1632
Subslot index 2	Bits	864
Subslot index 3	Bits	1056
Subslot index 4	Bits	1152
Subslot index 5	Bits	1632
For Sub-Frame 0	Bits	
Subslot index 1	Bits	1632
Subslot index 2	Bits	864
Subslot index 3	Bits	792
Subslot index 4	Bits	864
Subslot index 5	Bits	1632
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	
Subslot index 1	Bits	0
Subslot index 2	Bits	0
Subslot index 3	Bits	0
Subslot index 4	Bits	0
Subslot index 5	Bits	0
Max. Throughput averaged over 1 frame	kbps	787.2

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: Note SPDCCH is transmitted outside allocated resource blocks

A.1.2 TDD

Table A.1.2-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit	Value					
Reference channel		R.2 TDD		R.4 TDD	R.0 TDD	R.1 TDD	R.3 TDD
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1		1	1	2	1
Allocated resource blocks (Note 4)		2		11	24	24	24
Uplink-Downlink Configuration (Note 5)		1		1	1	1	1
Special Subframe Configuration (Note 6)		6		6	6	6	6
Allocated subframes per Radio Frame		6		6	6	6	6
Modulation		QPSK		QPSK	QPSK	QPSK	QPSK
Target Coding Rate		1/3		1/3	1/3	1/3	1/3
Information Bit Payload							
For Sub-Frames 4,9	Bits	120		968	2088	2088	2088
For Sub-Frame 5	Bits	104		968	2088	2088	2088
For Sub-Frame 0	Bits	56		616	2088	1736	2088
For Sub-Frame 1, 6 (DwPTS)	Bits	56		552	1032	1032	1032
Number of Code Blocks per Sub-Frame (Note 7)				1			1
For Sub-Frames 4,9		1		1	1	1	1
For Sub-Frame 5		1		1	1	1	1
For Sub-Frame 0		1		1	1	1	1
For Sub-Frame 1, 6 (DwPTS)		1		1	1	1	1
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits	456		2772	6624	6336	6624
For Sub-Frame 5	Bits	408		2628	6480	6192	6480
For Sub-Frame 0	Bits	224		2076	5928	5664	5928
For Sub-Frame 1, 6 (DwPTS)	Bits	272		1616	3696	3504	3696
Max. Throughput averaged over 1 frame	Mbps	0.05612		0.4624	1.0416	1.0064	1.0416

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.

Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].4 symbols allocated to PDCCH for 1.4 MHz channel BW.

Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].

Note 4: Allocation is located in the middle of bandwidth. If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].

Note 5: As per Table 4.2-2 in TS 36.211 [9].

Note 6: As per Table 4.2-1 in TS 36.211 [9].

Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).

Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

Table A.1.2-2: PDSCH Reference Measurement Channels for TDD UL/DL configuration0

Parameter	Unit	Value					
Reference channel					R.5 TDD		
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas					1		
Allocated resource blocks (Note 4)					24		
Uplink-Downlink Configuration (Note 5)					0		
Special Subframe Configuration (Note 6)					6		
Allocated subframes per Radio Frame					4		
Modulation					QPSK		
Target Coding Rate					1/3		
Information Bit Payload							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				2088		
For Sub-Frame 0	Bits				2088		
For Sub-Frame 1, 6 (DwPTS)	Bits				1032		
Number of Code Blocks per Sub-Frame (Note 7)					1		
For Sub-Frames 4,9					N/A		
For Sub-Frame 5					1		
For Sub-Frame 0					1		
For Sub-Frame 1, 6 (DwPTS)					1		
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				6480		
For Sub-Frame 0	Bits				5928		
For Sub-Frame 1, 6 (DwPTS)	Bits				3696		
Max. Throughput averaged over 1 frame	Mbps				0.624		

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: As per Table 4.2-2 in TS 36.211 [9].
Note 6: As per Table 4.2-1 in TS 36.211 [9].
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

Table A.1.2-3: PDSCH Reference Measurement Channels for TDD slot duration TTI

	Unit	R.6 TDD
Bandwidth	MHz	10
Number of transmit antennas		1
Allocated resource blocks(Note 4)		24
Uplink-Downlink Configuration (Note 5)		1
Special Subframe Configuration (Note 6)		6
Allocated subframes per Radio Frame		6
Modulation		QPSK
Target coding rate		1/3
Information Bit Payload		
For Sub-Frame 4, 9		
Slot index 0	Bits	872
Slot index 1	Bits	1224
For Sub-Frame 5		
Slot index 0	Bits	872
Slot index 1	Bits	1224
For Sub-Frame 0		
Slot index 0	Bits	872
Slot index 1	Bits	1032
For Sub-Frame 1, 6 (DwPTS)		(1032)
Slot index 0	Bits	872
Slot index 1	Bits	N/A
Number of Code Blocks per Sub-Frame		
For Sub-Frame 4, 9		
Slot index 0		1
Slot index 1		1
For Sub-Frame 5		
Slot index 0		1
Slot index 1		1
For Sub-Frame 0		
Slot index 0		1
Slot index 1		1
For Sub-Frame 1, 6 (DwPTS)		
Slot index 0		1
Slot index 1		N/A
Binary Channel Bits per slot		
For Sub-Frame 4, 9	Bits	
Slot index 0	Bits	2784
Slot index 1	Bits	3840
For Sub-Frame 5	Bits	
Slot index 0	Bits	2784
Slot index 1	Bits	3696
For Sub-Frame 0	Bits	
Slot index 0	Bits	2640
Slot index 1	Bits	3288
For Sub-Frame 1, 6 (DwPTS)	Bits	
Slot index 0	Bits	2640
Slot index 1	Bits	N/A
Max. Throughput averaged over 1 frame	kbps	999.6

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: As per Table 4.2-2 in TS 36.211 [9]
Note 6: As per Table 4.2-1 in TS 36.211 [9]
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 9: SPDCCH is transmitted outside allocated resource blocks

A.1.3 FDD for UE Category 0

Table A.1.3-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value		
Reference channel		R.13 FDD	R.14 FDD	R.15 FDD
Channel bandwidth	MHz	10	10	10
Number of transmitter antennas		1	2	2
Allocated resource blocks (Note 4)		24	24	24
Allocated subframes per Radio Frame		10	10	10
Modulation		QPSK	QPSK	QPSK
Target Coding Rate		1/10	1/10	1/10
Information Bit Payload				
For Sub-Frames 4, 9	Bits	648	648	648
For Sub-Frame 5	Bits	648	648	648
For Sub-Frame 0	Bits	648	648	648
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	648
Number of Code Blocks per Sub-Frame (Note 5)				
For Sub-Frames 4, 9		1	1	1
For Sub-Frame 5		1	1	1
For Sub-Frame 0		1	1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1	1
Binary Channel Bits Per Sub-Frame				
For Sub-Frames 4, 9	Bits	6624	6336	6636
For Sub-Frame 5	Bits	6336	6048	6408
For Sub-Frame 0	Bits	5784	5520	5520
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	6636
Max. Throughput averaged over 1 frame	kbps	259.2	259.2	648

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.4 HD-FDD for UE Category 0

Table A.1.4-1: PDSCH Reference Measurement Channels for HD-FDD

Parameter	Unit	Value	
Reference channel		R.1 HD-FDD	R.2 HD-FDD
Channel bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks (Note 4)		24	24
Allocated subframes per Radio Frame		10	10
Modulation		QPSK	QPSK
Target Coding Rate		1/10	1/10
Information Bit Payload			
For Sub-Frames 4, 9,	Bits	0	0
For Sub-Frame 5 (Note 7)	Bits	424	424
For Sub-Frame 0 (Note 7)		648	648
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
For Sub-Frame 1, 6	Bits		
Number of Code Blocks per Sub-Frame (Note 5)			
For Sub-Frames 4, 9		1	1
For Sub-Frame 5		1	1
For Sub-Frame 0		1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1
Binary Channel Bits Per Sub-Frame			
For Sub-Frames 4, 9	Bits	0	0
For Sub-Frame 5	Bits	6336	6048
For Sub-Frame 0	Bits	5784	5520
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
Max. Throughput averaged over 1 frame	kbps		

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.

A.1.5 TDD for UE Category 0

Table A.1.5-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit	Value	
Reference channel		R.12 TDD	R.13 TDD
Channel bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks (Note 4)		24	24
Uplink-Downlink Configuration (Note 5)		1	1
Special Subframe Configuration (Note 6)		6	6
Allocated subframes per Radio Frame		6	6
Modulation		QPSK	QPSK
Target Coding Rate		1/10	1/10
Information Bit Payload			
For Sub-Frames 4,9	Bits	648	648
For Sub-Frame 5	Bits	648	648
For Sub-Frame 0	Bits	648	648
For Sub-Frame 1, 6 (DwPTS)	Bits	488	488
Number of Code Blocks per Sub-Frame (Note 7)		1	1
For Sub-Frames 4,9		1	1
For Sub-Frame 5		1	1
For Sub-Frame 0		1	1
For Sub-Frame 1, 6 (DwPTS)		1	1
Binary Channel Bits Per Sub-Frame			
For Sub-Frames 4,9	Bits	6624	6336
For Sub-Frame 5	Bits	6580	6192
For Sub-Frame 0	Bits	5928	5664
For Sub-Frame 1, 6 (DwPTS)	Bits	3696	3408
Max. Throughput averaged over 1 frame	Mbps	0.3552	0.3552

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: As per Table 4.2-2 in TS 36.211 [9]
Note 6: As per Table 4.2-1 in TS 36.211 [9]
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.6 Frame Structure 3

Table A.1.6-1: PDSCH Reference Measurement Channels for FS 3

Parameter	Unit	Value				
Reference channel					R.0 FS3	R.1 FS3
Channel bandwidth	MHz				20	20
Number of transmitter antennas					1	1
Allocated resource blocks (Note 4)					24	24
Allocated subframes per Radio Frame					10	10
Modulation					QPSK	QPSK
Target Coding Rate					1/3	1/3
Information Bit Payload						
For Sub-Frames 4, 9	Bits				2088	2088
For Sub-Frame 5	Bits				2088	2088
For Sub-Frame 0	Bits				2088	2088 (Note 7)
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				2088	0
Number of Code Blocks per Sub-Frame (Note 5)						
For Sub-Frames 4, 9					1	1
For Sub-Frame 5					1	1
For Sub-Frame 0					1	1
For Sub-Frame 1, 2, 3, 6, 7, 8					1	1
Binary Channel Bits Per Sub-Frame						
For Sub-Frames 4, 9	Bits				6624	6624
For Sub-Frame 5	Bits				6336	6336
For Sub-Frame 0	Bits				6336	6336
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				6624	0
Max. Throughput averaged over 1 frame	kbps				2088	2088

Note 1: 2 symbols allocated to PDCCH for 20 MHz channel BW.
Note 2: Reference signal, synchronization signals allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: PDSCH allocation applies only to subframes where there is no DRS transmission
Note 8: PDSCH is not transmitted in subframes where it is determined that transmission should not occur according to the listen before talk (LBT model).
Note 9: Max throughput averaged over 1 frame does not account for missed PDSCH transmission due to LBT or DRS transmission

A.2 PCFICH/PDCCH/PHICH

A.2.1 FDD

Table A.2.1-1: PCFICH/PDCCH/PHICH Reference Channel for FDD

Parameter	Unit	Value							
Reference channel		R.8 FDD	R.11 FDD	R.12 FDD	R.10 FDD	R.13 FDD	R.6 FDD	R.7 FDD	R.9 FDD
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols[Note1]	symbols	4	3	3	2	2	2	2	3
Aggregation level	CCE	2 (Note 6)	8	8	8	8	8	8	8
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5

Note 1: The control region consists of PCFICH, PHICH and PDCCH.
Note 2: DCI formats are defined in TS 36.212.
Note 3: DCI format shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: Payload size shall depend upon the test configuration.
Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.2.2 TDD

Table A.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit	Value							
Reference channel		R.8 TDD	R11 TDD	R.12 FDD	R.10 TDD	R.13 TDD	R.6 TDD	R.7 TDD	R.9 TDD
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols[Note1]	symbols	4 (Note 6)	3	3	2	2	2	2	3
Aggregation level	CCE	2 (Note 7)	8	8	8	8	8	8	8
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5

Note 1: The control region consists of PCFICH, PHICH and PDCCH.
Note 2: DCI formats are defined in 3GPP TS 36.212.
Note 3: DCI format shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: Payload size shall depend upon the test configuration.
Note 6: Only 2 OFDM symbols for special subframes 1 and 6.
Note 7: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.2.3 HD-FDD for UE category 0

Table A.2.3-1: PCFICH/PDCCH/PHICH Reference Channel for HD-FDD

Parameter	Unit	Value		
Reference channel		R.3 HD-FDD	R.4 HD-FDD	R.5 HD-FDD
Channel bandwidth	MHz	10	10	10
Number of transmitter antennas		1	2	2
Control region OFDM symbols[Note1]	symbols	2	2	3
Aggregation level	CCE	8	8	8
DCI Format		Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used. Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.				

A.2.4 FS 3

Table A.2.4-1: PCFICH/PDCCH/PHICH Reference Channel for FS 3

Parameter	Unit	Value				
Reference channel					R.0 FS3	
Channel bandwidth	MHz	10	10	10	20	
Number of transmitter antennas					1	
Control region OFDM symbols[Note1]	symbols				2	
Aggregation level	CCE				8	
DCI Format					Note 3	
Cell ID					Note 4	
Payload (without CRC)	Bits				Note 5	
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used. Note 7: PCFICH/PDCCH/PHICH allocation applies only to subframes where there is no DRS transmission Note 8: PCFICH/PDCCH/PHICH are not transmitted in subframes where it is determined that transmission should not occur according to the listen before talk (LBT model).						

A.3 PUSCH

This rule applies to E-UTRA cell(s), which the UE is connected to. The UE is in RRC-CONNECTED mode.

When signalling or data payloads are expected to be sent on the PUSCH, the UE may be provided in advance with PUSCH resources by the SS. For sake of simplicity the PUSCH scheduling may also occur continuously over many consecutive subframes. These options shall not be used if:
1) stated otherwise in the test description, or
2) the transmission of PUSCH and UL scheduling information affects the test purpose (e.g. DRX, PUCCH reception etc.)

For handover test cases, after RRC Connection reconfiguration message implying handover is sent, the UE shall be provided continuously with PUSCH resources by the SS in the source cell. This is done in order to make the requirement UE implementation agnostic, w.r.t. different delays caused by different handling of positive RLC

acknowledgements, which are not mandatory and of lower priority than the handover procedure progress (subclause 5.3.5.4 [5]).

If a PUSCH scheduling occurs, the SS sends uplink scheduling information via PDCCH DCI format 0 for C-RNTI to the UE. The UE sends uplink MAC padding bits on the PUSCH.

A.4 Reference Measurement Channels for ProSe Direct Discovery

A.4.1 FDD

Table A.4.1-1: PSDCH Reference Measurement Channels for FDD

Parameter	Unit	Value
Reference channel		D.1 FDD
Channel bandwidth	MHz	5
Allocated resource blocks		2
Subcarriers per resource block		12
Allocated subframes per Discovery period		1
DFT-OFDM Symbols per subframe (see note)		11
Modulation		QPSK
Information Bit Payload		232
Transport block CRC	Bits	24
Maximum number of HARQ transmissions		1
Binary Channel Bits (see note)	Bits	528
NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.		

A.5 Reference measurement channels for ProSe Direct Communication

A.5.1 FDD

Table A.5.1-1: PSCCH Reference Measurement Channels for FDD

Parameter		Unit	Value	
Reference channel			CC.1 FDD	CC.2 FDD
Channel bandwidth		MHz	5	10
Allocated resource blocks			1	1
Subcarriers per resource block			12	12
DFT-OFDM Symbols per subframe (see Note 1)			11	11
Modulation			QPSK	QPSK
Information Bit Payload		Bits	41	43
Information bits	Frequency hopping flag		0	
	RB assignment		Set as per PSSCH RB allocation specific in the test	
	Time resource pattern (I_{TRP})		0 (Note 2)	
	Modulation and coding scheme		Set as the PSSCH MCS specified in the test	
	Timing advance indication		0	
	Group destination ID		As set by higher layers	

Transport block CRC	Bits	16	16
Maximum number of HARQ transmissions		2	2
Binary Channel Bits (see Note 1)	Bits	264	264
NOTE1: PSCCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211. NOTE 2: For N_{TRP} = 8 (FDD) and *trpt-Subset* = 001, I_{TRP} = 0 corresponds to a time repetition pattern of (1,0,0,0,0,0,0,0) as per TS 36.213.			

Table A.5.1-2: PSSCH Reference Measurement Channels for FDD

Parameter	Unit	Value	
Reference channel		CD.1 FDD	CD.2 FDD
Channel bandwidth	MHz	5	10
Allocated resource blocks		2	3
Subcarriers per resource block		12	12
DFT-OFDM Symbols per subframe (see Note 1)		11	11
Modulation		QPSK	QPSK
Target Code Rate		1/3	1/3
Information Bit Payload		176	256
Transport block CRC	Bits	24	24
Maximum number of HARQ transmissions		3	3
Binary Channel Bits (see note)	Bits	528	1056
NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.			

A.6 ProSe Receive Traffic Generator

This clause defines the configuration for active Sidelink UEs used to generate receive traffic in ProSe RRM tests.

A.6.1 ProSe Direct Communication Receive Traffic Generator for FDD

Table A.6.1-1: Active Sidelink UE configuration for ProSe Direct Communication

Configuration			PCP.1.FDD
Channel BW		MHz	5 or 10
Number of Active Sidelink UEs per sc-period			5 MHz: 12 10 MHz: 16
Active Sidelink UEs	PSCCH RMC (defined in A.5)		5 MHz: CC.1 FDD 10 MHz: CC.2 FDD
	PSCCH resource allocation		5MHz: [2i:2i], for Sidelink UE i=0,..,11 10MHz:[3i:3i], for Sidelink UE i = 0, .., 15
	PSSCH RMC (defined in A.5)		5 MHz: CD.1 FDD 10 MHz: CD.2 FDD
	PSSCH resource allocation		Non-overlapping RBs 5MHz: [2i:2i+1], for Sidelink UE i = 0, .., 11 10MHz:[3i:3i+2], for Sidelink UE i = 0, .., 15
	RSRP	dBm/15kHz	-98

A.6.2 ProSe Direct Discovery Receive Traffic Generator for FDD

Table A.6.2-1: Active Sidelink UE configuration for ProSe Direct Discovery

Configuration			PDP.1.FDD	PDP.2.FDD
Channel BW		MHz	5	
Number of Active Sidelink UEs per Discovery subframe			12	
Active Sidelink UEs	Sidelink UE Transmissions		PSDCH (RMC D.1 FDD)	PSDCH (RMC D.1 FDD) + SLSS on synchronization subframe
	Resource allocation		Non overlapping RBs in a subframe	
	RSRP	dBm/15kHz	-95	

A.7 MPDCCH Reference Channels for Cat-M1 UEs

MPDCCH reference measurement channels in this section can be used in tests for Cat-M2 UEs.

A.7.1 FDD in CEModeA

Table A.7.1-1: MPDCCH Reference Channel for Cat-M1 FDD UEs in CEModeA

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.16 FDD	R.17 FDD	R.24 FDD	R.25 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1A	6-1A	6-1A	6-1A
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4	4	4
Aggregation level	ECCE	16	16	16	16
Maximum number of repetitions	-	8	8	8	8
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	7th	7th	4th	4th
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Payload (without CRC)	Bits	Note 1	Note 1	Note 1	Note 1
Cell ID	-	Note 2	Note 2	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.					

A.7.2 HD-FDD in CEModeA

Table A.7.2-1: MPDCCH Reference Channel for Cat-M1 HD-FDD UEs in CEModeA

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.6 HD-FDD	R.7 HD-FDD	R.14 HD-FDD	R.15 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1A	6-1A	6-1A	6-1A
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4	4	4
Aggregation level	ECCE	16	16	16	16
Maximum number of repetitions	-	8	8	8	8
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	7th	7th	4th	4th
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Payload (without CRC)	Bits	Note 1	Note 1	Note 1	Note 1
Cell ID	-	Note 2	Note 2	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.					

A.7.3 TDD in CEModeA

Table A.7.3-1: MPDCCH Reference Channel for Cat-M1 TDD UEs in CEModeA

Parameter	Unit	Value	
MPDCCH Reference channel	-	R.14 TDD	R.15 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas	-	1	2
DCI Format	-	6-1A	6-1A
Transmission Type	-	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4
Aggregation level	ECCE	16	16
Maximum number of repetitions	-	8	8
Frequency hopping	-	ON	ON
Number of narrowbands	-	2	2
MPDCCH Narrowband	-	7th	7th
Frequency HoppingOffset	narrowbands	7	7
MPDCCH start subframe	subframes	1	1
MPDCCH start symbol	symbols	2	2
Frequency hopping interval	subframes	10	10
Payload (without CRC)	Bits	Note 1	Note 1
Cell ID	-	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.			

A.7.4 FDD in CEModeB

Table A.7.4-1: MPDCCH Reference Channel for Cat-M1 FDD UEs in CEModeB

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.18 FDD	R.19 FDD	R.26 FDD	R.27 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1B	6-1B	6-1B	6-1B
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6	6	6
Aggregation level	ECCE	24	24	24	24
Maximum number of repetitions	-	128	128	128	128
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	7th	7th	4th	4th
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Payload (without CRC)	Bits	17	17	17	17
Cell ID	-	Note 1	Note 1	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.					

A.7.5 HD-FDD in CEModeB

Table A.7.5-1: MPDCCH Reference Channel for Cat-M1 HD-FDD UEs in CEModeB

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.8 HD-FDD	R.9 HD-FDD	R.16 HD-FDD	R.17 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1B	6-1B	6-1B	6-1B
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6	6	6
Aggregation level	ECCE	24	24	24	24
Maximum number of repetitions	-	128	128	128	128
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	7th	7th	4th	4th
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Payload (without CRC)	Bits	17	17	17	17
Cell ID	-	Note 1	Note 1	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.					

A.7.6 TDD in CEModeB

Table A.7.6-1: MPDCCH Reference Channel for Cat-M1 TDD UEs in CEModeB

Parameter	Unit	Value	
MPDCCH Reference channel	-	R.16 TDD	R.17 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas	-	1	2
DCI Format	-	6-1B	6-1B
Transmission Type	-	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6
Aggregation level	ECCE	24	24
Maximum number of repetitions	-	128	128
Frequency hopping	-	ON	ON
Number of narrowbands	-	2	2
MPDCCH Narrowband	-	7th	7th
Frequency HoppingOffset	narrowbands	7	7
MPDCCH start subframe	subframes	1	1
MPDCCH start symbol	symbols	2	2
Frequency hopping interval	subframes	20	20
Payload (without CRC)	Bits	17	17
Cell ID	-	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.			

A.8 PDSCH Reference Channels for Cat-M1 UEs

A.8.1 FDD in CEModeA

Table A.8.1-1: PDSCH Reference Channel for Cat-M1 FDD in CEModeA

Parameter	Unit	Value					
PDSCH Reference channel		R.20 FDD	R.21 FDD	R.28 FDD	R.29 FDD	R.32 FDD	R.33 FDD
Carrier bandwidth	MHz	10	10	5	5	10	10
Number of transmitter antennas		1	2	1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3	1/3	1/3
Information Bit Payload							
Sub-Frames 0 ~ 9	Bits	32	32	32	32	32	32
Number of Code Blocks per Sub-Frame							
Sub-Frames 0 ~ 9		1	1	1	1	1	1
Maximum number of repetitions		16	16	16	16	1	1
Frequency hopping		ON	ON	ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2	2	2
PDSCH Narrowband		2nd	2nd	2nd	2nd	2nd	2nd
Frequency HoppingOffset	narrowbands	7	7	3	3	7	7
PDSCH start symbol	symbols	2	2	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4	4	4
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.							

A.8.2 HD-FDD in CEModeA

Table A.8.2-1: PDSCH Reference Channel for Cat-M1 HD-FDD in CEModeA

Parameter	Unit	Value					
PDSCH Reference channel		R.10 HD-FDD	R.11 HD-FDD	R.18 HD-FDD	R.19 HD-FDD	R.24 HD-FDD	R.25 HD-FDD
Carrier bandwidth	MHz	10	10	5	5	10	10
Number of transmitter antennas		1	2	1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3	1/3	1/3
Information Bit Payload							
Sub-Frames 0 ~ 9	Bits	32	32	32	32	32	32
Number of Code Blocks per Sub-Frame							
Sub-Frames 0 ~ 9		1	1	1	1	1	1
Maximum number of repetitions		16	16	16	16	1	1
Frequency hopping		ON	ON	ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2	2	2
PDSCH Narrowband		1st	1st	1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3	7	7
PDSCH start symbol	symbols	2	2	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4	4	4
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.							

A.8.3 TDD in CEModeA

Table A.8.3-1: PDSCH Reference Channel for Cat-M1 TDD in CEModeA

Parameter	Unit	Value	
PDSCH Reference channel		R.16 TDD	R.17 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks Note1	PRBs	2	2
Allocated subframes per Radio Frame		4	4
TDD Uplink-Downlink Configuration		0	0
TDD Special Subframe Configuration		6	6
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
All Sub-Frames except 1, 6 (TDD)	Bits	32	32
All Sub-Frames except 1, 6 (TDD DwPTS)	-	0	0
Number of Code Blocks per Sub-Frame		1	1
All Sub-Frames except 1, 6 (TDD)		1	1
All Sub-Frames except 1, 6 (TDD DwPTS)		0	0
Maximum number of repetitions		16	16
Frequency hopping		ON	ON
Number of narrowbands for frequency hopping		2	2
PDSCH Narrowband		2nd	2nd
Frequency HoppingOffset	narrowbands	7	7
PDSCH start symbol	symbols	2	2
Frequency hopping interval	subframes	10	10
Max. Throughput averaged over 1 frame	kbps	TBD	TBD
Cell ID		Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.			

A.8.4 FDD in CEModeB

Table A.8.4-1: PDSCH Reference Channel for Cat-M1 FDD in CEModeB

Parameter	Unit	Value			
PDSCH Reference channel		R.22 FDD	R.23 FDD	R.30 FDD	R.31 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]		2	2	2	2
Allocated subframes per Radio Frame	-	10	10	10	10
Modulation	-	QPSK	QPSK	QPSK	QPSK
Target coding rate	-	1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9	-	1	1	1	1
Maximum number of repetitions	-	192	192	192	192
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband	-	2nd	2nd	2nd	2nd
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.5 HD-FDD in CEModeB

Table A.8.5-1: PDSCH Reference Channel for Cat-M1 HD-FDD in CEModeB

Parameter	Unit	Value			
PDSCH Reference channel		R.12 HD-FDD	R.13 HD-FDD	R.20 HD-FDD	R.21 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9		1	1	1	1
Maximum number of repetitions		192	192	192	192
Frequency hopping		ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband		1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.6 TDD in CEModeB

Table A.8.6-1: PDSCH Reference Channel for Cat-M1 TDD in CEModeB

Parameter	Unit	Value	
PDSCH Reference channel		R.18 TDD	R.19 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks[Note1]	PRBs	2	2
Allocated subframes per Radio Frame		4	4
TDD Uplink-Downlink Configuration		0	0
TDD Special Subframe Configuration		6	6
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
All Sub-Frames except 1, 6 (TDD)	Bits	32	32
All Sub-Frames except 1, 6 (TDD DwPTS)	-	0	0
Number of Code Blocks per Sub-Frame		1	1
All Sub-Frames except 1, 6 (TDD)		1	1
All Sub-Frames except 1, 6 (TDD DwPTS)		0	0
Maximum number of repetitions		192	192
Frequency hopping		ON	ON
Number of narrowbands for frequency hopping		2	2
PDSCH Narrowband		2nd	2nd
Frequency HoppingOffset	narrowbands	7	7
PDSCH start symbol	symbols	2	2
Frequency hopping interval	subframes	20	20
Max. Throughput averaged over 1 frame	kbps	TBD	TBD
Cell ID		Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.			

A.9 Reference PRACH Configurations

Table A.9-1: PRACH configuration parameters

Parameter	Value			Comments
Reference configuration	PRACH_2CE	PRACH_3CE	PRACH_4CE	
RsrpThresholdsPRACH	{-99} dBm	{-107, -99} dBm	{-107, -99, -92} dBm	As defined in TS 36.331 [5]
CE level0:	Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	FDD : 4 TDD : 53	FDD : 4 TDD : 53	FDD : 4 TDD : 53	See TS 36.211 [9] section 5.7.1
numRepetitionPerPreambleAttempt:	1	1	1	Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [9]
prach-HoppingConfig:	off	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level1:	Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	FDD : 4 TDD : 53	FDD : 4 TDD : 53	FDD : 4 TDD : 53	see TS 36.211 [9] section 5.7.1
numRepetitionPerPreambleAttempt:	128	64	32	Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [9]
prach-HoppingConfig:	off	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level2:	Not Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	-	FDD : 4 TDD : 53	FDD : 4 TDD : 53	see TS 36.211 [9] section 5.7.1
numRepetitionPerPreambleAttempt:	-	128	64	Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [9]
prach-HoppingConfig:	-	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level3:	Not Configured	Not Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	-	-	FDD : 4 TDD : 53	see TS 36.211 [9] section 5.7.1
numRepetitionPerPreambleAttempt:	-	-	128	Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [9]
prach-HoppingConfig:	-	-	off	Coverage level specific frequency hopping configuration for PRACH

A.10 General configuration for NB-IoT

This clause defines the configuration for category NB1 UEs used in NB-IoT RRM tests.

A.10.1 NPDCCH Reference Channel for UE category NB1

A.10.1.1 In-band operation

Table A.10.1.1-1: NPDCCH Reference Channel for UE category NB1 for in-band operation in 10MHz LTE system

Parameter	Unit	Value			
NPDCCH Reference channel	-	R.26 HD-FDD R.26 NB-TDD	R.27 HD-FDD R.27 NB-TDD	R.28 HD-FDD R.28 NB-TDD	R.29 HD-FDD R.29 NB-TDD
LTE Carrier bandwidth	MHz	10	10	10	10
Allocated resource blocks Note1	PRB	1	1	1	1
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	N1	N1	N0	N0
Aggregation level	NCCE	2	2	2	2
Maximum number of repetitions	-	Note 2	Note 2	Note 2	Note 2
NPDCCH start symbol	symbols	3	3	3	3
Payload (without CRC)	Bits	Note 3	Note 3	Note 3	Note 3
Cell ID	-	Note 4	Note 4	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.					

Table A.10.1.1-2: NPDCCH Reference Channel for UE category NB1 for in-band operation in 5MHz LTE system

Parameter	Unit	Value			
NPDCCH Reference channel	-	R.38 HD-FDD	R.39 HD-FDD	R.40 HD-FDD	R.41 HD-FDD
LTE Carrier bandwidth	MHz	5	5	5	5
Allocated resource blocks Note1	PRB	1	1	1	1
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	N1	N1	N0	N0
Aggregation level	NCCE	2	2	2	2
Maximum number of repetitions	-	Note 2	Note 2	Note 2	Note 2
NPDCCH start symbol	symbols	3	3	3	3
Payload (without CRC)	Bits	Note 3	Note 3	Note 3	Note 3
Cell ID	-	Note 4	Note 4	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.					

A.10.1.2 Standalone operation

Table A.10.1.2-1: NPDCCH Reference Channel for UE category NB1 for standalone operation

Parameter	Unit	Value			
NPDCCH Reference channel	-	R.30 HD-FDD R.30 NB-TDD	R.31 HD-FDD R.31 NB-TDD	R.32 HD-FDD R.32 NB-TDD	R.33 HD-FDD R.33 NB-TDD
Channel bandwidth	KHz	200	200	200	200
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	N1	N1	N0	N0
Aggregation level	NCCE	2	2	2	2
Maximum number of repetitions	-	Note 2	Note 2	Note 2	Note 2
Payload (without CRC)	Bits	Note 3	Note 3	Note 3	Note 3
Cell ID	-	Note 4	Note 4	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.					

A.10.1.3 Guard band operation

Table A.10.1.3-1: NPDCCH Reference Channel for UE category NB1 for guard band operation

Parameter	Unit	Value			
NPDCCH Reference channel	-	R.34 HD-FDD R.34 NB-TDD	R.35 HD-FDD R.35 NB-TDD	R.36 HD-FDD R.36 NB-TDD	R.37 HD-FDD R.37 NB-TDD
LTE Carrier bandwidth	MHz	10	10	10	10
Allocated resource blocks for NB-ioT[Note1]	PRB	1	1	1	1
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	N1	N1	N0	N0
Aggregation level	NCCE	2	2	2	2
Maximum number of repetitions	-	Note 2	Note 2	Note 2	Note 2
Payload (without CRC)	Bits	Note 3	Note 3	Note 3	Note 3
Cell ID	-	Note 4	Note 4	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.					

A.10.2 NPDSCH Reference Channel for UE category NB1

A.10.2.1 HD-FDD in-band operation

Table A.10.2.1-1: NPDSCH Reference Channel for UE category NB1 for in-band operation

Parameter	Unit	Value			
NPDSCH Reference channel	-	R.14 HD-FDD	R.15 HD-FDD	R.16 HD-FDD	R.17 HD-FDD
LTE Carrier bandwidth	MHz	10	10	5	5
Allocated resource blocks Note1	PRB	1	1	1	1
Number of transmitter antennas	-	1	2	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1	Note 1	Note 1
Modulation		QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3
Information Bit Payload					
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	40 Note 2	40 Note 2	40 Note 2	40 Note 2
For Sub-Frame 4, 9	Bits	Note 3	Note 3	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0	0	0
Number of Code Blocks per Sub-Frame					
For Sub-Frame 1, 2, 3, 6, 7, 8		1 Note 4	1 Note 4	1 Note 4	1 Note 4
For Sub-Frame 4, 9		Note 5	Note 5	Note 5	Note 5
For Sub-Frame 0, 5		0	0	0	0
Maximum number of repetitions	-	Note 6	Note 6	Note 6	Note 6
NPDCCH start symbol	symbols	3	3	3	3
Cell ID	-	Note 7	Note 7	Note 7	Note 7

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: Only apply for subframes scheduled with NPDSCH.
Note 3: 40 for subframes scheduled with NPDSCH when $n_f \bmod 2 \neq 0$. Otherwise 0.
Note 4: Only apply for subframes scheduled with NPDSCH.
Note 5: 1 for subframes scheduled with NPDSCH when $n_f \bmod 2 \neq 0$. Otherwise 0.
Note 6: Maximum number of repetitions shall depend upon the test configuration.
Note 7: Cell ID shall depend upon the test configuration.

A.10.2.2 HD-FDD standalone operation

Table A.10.2.2-1: NPDSCH Reference Channel for UE category NB1 for standalone operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.18 HD-FDD	R.19 HD-FDD
Channel bandwidth	KHz	200	200
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	72 Note 2	72 Note 2
For Sub-Frame 4, 9	Bits	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0
Number of Code Blocks per Sub-Frame			
For Sub-Frame 1, 2, 3, 6, 7, 8		1 Note 4	1 Note 4
For Sub-Frame 4, 9		Note 5	Note 5
For Sub-Frame 0, 5		0	0
Maximum number of repetitions	-	Note 6	Note 6
Cell ID	-	Note 7	Note 7

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: only apply for subframes scheduled with NPDSCH
Note 3: 72 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0.
Note 4: only apply for subframes scheduled with NPDSCH.
Note 5: 1 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0.
Note 6: Maximum number of repetitions shall depend upon the test configuration.
Note 7: Cell ID shall depend upon the test configuration.

A.10.2.3 HD-FDD guard band operation

Table A.10.2.3-1: NPDSCH Reference Channel for UE category NB1 for guard band operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.22 HD-FDD	R.23 HD-FDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks for NB-IoT Note1	PRB	1	1
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	72 Note 2	72 Note 2
For Sub-Frame 4, 9	Bits	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0
Number of Code Blocks per Sub-Frame			
For Sub-Frame 1, 2, 3, 6, 7, 8		1 Note 4	1 Note 4
For Sub-Frame 4, 9		Note 5	Note 5
For Sub-Frame 0, 5		0	0
Maximum number of repetitions	-	Note 6	Note 6
Cell ID	-	Note 7	Note 7

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: only apply for subframes scheduled with NPDSCH.
Note 3: 72 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0.
Note 4: only apply for subframes scheduled with NPDSCH.
Note 5: 1 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0.
Note 6: Maximum number of repetitions shall depend upon the test configuration.
Note 7: Cell ID shall depend upon the test configuration.

A.10.2.4 TDD in-band operation

Table A.10.2.4-1: NPDSCH Reference Channel for UE category NB1 for in-band operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.14 NB-TDD	R.15 NB-TDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks	PRB	1	1
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 4	Bits	40 Note 2	40 Note 2
For Sub-Frame 0, 5, 9	Bits	0	0
For Sub-Frame 1, 6 (DwPTS)	Bits	16 or 40 Note 6	16 or 40 Note 6
Number of Code Blocks per Sub-Frame			
For Sub-Frame 4		1 Note 2	1 Note 2
For Sub-Frame 0, 5, 9		0	0
For Sub-Frame 1, 6 (DwPTS)		1	1
Maximum number of repetitions	-	Note 3	Note 3
NPDCCH start symbol	symbols	3	3
Cell ID	-	Note 4	Note 4

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: Only apply for subframes scheduled with NPDSCH.
Note 3: Maximum number of repetitions shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: SIB1-NB is transmitted in subframe 0 in odd radio frames.
Note 6: Set 40 when NPDSCH is transmitted with repetition. Set 16 when NPDSCH is transmitted without repetition.

A.10.2.5 TDD standalone operation

Table A.10.2.5-1: NPDSCH Reference Channel for UE category NB1 for standalone operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.18 NB-TDD	R.19 NB-TDD
Channel bandwidth	KHz	200	200
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 4	Bits	72 Note 2	72 Note 2
For Sub-Frame 0, 5, 9	Bits	0	0
For Sub-Frame 1, 6 (DwPTS)	Bits	40 or 72 Note 6	40 or 72 Note 6
Number of Code Blocks per Sub-Frame			
For Sub-Frame 4		1 Note 2	1 Note 2
For Sub-Frame 0, 5, 9		0	0
For Sub-Frame 1, 6 (DwPTS)		1	1
Maximum number of repetitions	-	Note 3	Note 3
Cell ID	-	Note 4	Note 4

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: Only apply for subframes scheduled with NPDSCH.
Note 3: Maximum number of repetitions shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: SIB1-NB is transmitted in subframe 0 in odd radio frames.
Note 6: Set 72 when NPDSCH is transmitted with repetition. Set 40 when NPDSCH is transmitted without repetition.

A.10.2.6 TDD guard band operation

Table A.10.2.6-1: NPDSCH Reference Channel for UE category NB1 for guard band operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.22 NB-TDD	R.23 NB-TDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks for NB-IoT	PRB	1	1
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 4	Bits	72 Note 2	72 Note 2
For Sub-Frame 0, 5, 9	Bits	0	0
For Sub-Frame 1, 6 (DwPTS)	Bits	40 or 72 Note 6	40 or 72 Note 6
Number of Code Blocks per Sub-Frame			
For Sub-Frame 4		1 Note 2	1 Note 2
For Sub-Frame 0, 5, 9		0	0
For Sub-Frame 1, 6 (DwPTS)		1	1
Maximum number of repetitions	-	Note 3	Note 3
Cell ID	-	Note 4	Note 4

Note 1: Shall depend upon the NPDSCH scheduling.
Note 2: Only apply for subframes scheduled with NPDSCH.
Note 3: Maximum number of repetitions shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: SIB1-NB is transmitted in subframe 0 in odd radio frames.
Note 6: Set 72 when NPDSCH is transmitted with repetition. Set 40 when NPDSCH is transmitted without repetition.

A.10.3 Reference NPRACH Configurations

Table A.10.3-1 and A.10.3-2 defines the reference NB-IoT PRACH configurations for a NB-IoT RRM test case where the UE is required to transmit NPRACH during the testing procedure, but the testing purpose of the RRM test case does not include testing NPRACH performance.

Table A.10.3-1: NPRACH.R-1: HD-FDD Reference NPRACH Configuration

Field	Value			Comment
Prameters not per NPRACH coverage level				
rsrp-ThresholdsPrach	{rsrp1, rsrp2}			The values of NPRACH RSRP thresholds for will be set according the requirement of individual test cases
nprach-CP-Length	us66dot7			NPRACH format 0
Parameters per NPRACH coverage Level				
CE Level	**Level 0**	**Level 1**	**Level 2**	**Valid values as defined in TS 36.331 [5]**
nprach-Periodicity	ms40	ms40	ms40	{ms40, ms80, ms160, ms240, ms320, ms640, ms1280, ms2560}
nprach-StartTime	ms8	ms8	ms8	{ms8, ms16, ms32, ms64, ms128, ms256, ms512, ms1024}
nprach-SubcarrierOffset	n0	n0	n0	{n0, n12, n24, n36, n2, n18, n34}
nprach-NumSubcarriers	n12	n12	n12	{n12, n24, n36, n48}
nprach-SubcarrierMSG3-RangeStart	{one}	{one}	{one}	{zero, oneThird, twoThird, one}
maxNumPreambleAttemptCE	n3	n5	n7	{n3, n4, n5, n6, n7, n8, n10}
numRepetitionsPerPreambleAttempt	n1	n8	n32	{n1, n2, n4, n8, n16, n32, n64, n128}
npdcch-NumRepetitions-RA	r1	r8	r32	{r1, r2, r4, r8, r16, r32, r64, r128, r256, r512, r1024, r2048}
npdcch-StartSF-CSS-RA	V8	v2	v2	{v1dot5, v2, v4, v8, v16, v32, v48, v64}
npdcch-Offset-RA	zero	Zero	zero	{zero, oneEighth, oneFourth, threeEighth}
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.				

Table A.10.3-2: NPRACH.R-2: TDD Reference NPRACH Configuration

Field	Value			Comment
Prameters not per NPRACH coverage level				
rsrp-ThresholdsPrach	{rsrp1, rsrp2}			The values of NPRACH RSRP thresholds for will be set according the requirement of individual test cases
nprach-PreambleFormat	fmt-0			See TS 36.211 [9] section 10.1.6
Parameters per NPRACH coverage Level				
CE Level	**Level 0**	**Level 1**	**Level 2**	**Valid values as defined in TS 36.331 [5]**
nprach-Periodicity	ms80	ms80	ms80	{ms80, ms160, ms320, ms640, ms1280, ms2560, ms5120, ms10240}
nprach-StartTime	ms10	ms10	ms10	{ms10, ms20, ms40, ms80, ms160, ms320, ms640, ms1280, ms 2560, ms5120}
nprach-SubcarrierOffset	n0	n0	n0	{n0, n12, n24, n36, n2, n18, n34}
nprach-NumSubcarriers	n12	n12	n12	{n12, n24, n36, n48}
nprach-SubcarrierMSG3-RangeStart	{one}	{one}	{one}	{zero, oneThird, twoThird, one}
maxNumPreambleAttemptCE	n3	n5	n7	{n3, n4, n5, n6, n7, n8, n10}
numRepetitionsPerPreambleAttempt	n1	n8	n32	{n1, n2, n4, n8, n16, n32, n64, n128, n256, n512, n1024}
npdcch-NumRepetitions-RA	r1	r8	r32	{r1, r2, r4, r8, r16, r32, r64, r128, r256, r512, r1024, r2048}
npdcch-StartSF-CSS-RA	v8	v4	v4	{v4, v8, v16, v32, v48, v64, v96, v128}
npdcch-Offset-RA	zero	zero	zero	{zero, oneEighth, oneFourth, threeEighth}
nprach-NumCBRA-StartSubcarriers	n8	n8	n8	{n8, n10, n11, n12, n20, n22, n23, n24, n32, n34, n35, n36, n40, n44, n48}
Note 1: See Clause 6.7.3.2 in TS 36.331 [5] for further information on the parameters in this table.				

A.11 V2V Sidelink Communication on Dedicated V2V Carrier

A.11.1 Introduction

This clause also defines the principle and the reference configurations that are applicable to test cases verifying RRM core requirements for V2V sidelink communication on dedicated V2V carrier.

A.11.2 Reference resource pool configurations for V2V Sidelink Communication

Table A.11.2-1: Pre-configuration for V2V Sidelink Communication

Derivation Path: TS 36.331 [3] clause 9.3.2, SL-V2X-Preconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0	Indicates the offset of the first subframe of a resource pool within a SFN cycle. If absent, the resource pool starts from first subframe of SFN=0.	
sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList	10000000000000000000 10000000000000000000 10000000000000000000 10000000000000000000 10000000000000000000	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23])	
sl-Subframe-r14 included in SL-PreconfigV2X-RxPoolList	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111	Indicates the bitmap of the RX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23])	
adjacencyPSCCH-PSSCH-r14	True	Adjacent: TRUE Non-adjacent: FALSE	
sizeSubchannel-r14	5	Minimum bandwidth of subchannel for adjacent transmission	
startRB-Subchannel-r14	0	Indicates the lowest RB index of the subchannel with the lowest index.	
startRB-PSCCH-Pool-r14	0	Indicates the lowest RB index of the PSCCH pool	
}			

A.11.3 Reference measurement channels for V2V Sidelink Communication

Table A.11.3-1: PSCCH Reference Measurement Channels

Parameter		Unit	Value
Reference channel			CC.1
Channel bandwidth		MHz	10
Allocated PSCCH resource blocks			2
DFT-OFDM symbols per subframe (see Note 1)			9
Modulation			QPSK
Information Bit Payload (without CRC)		Bits	32
Information Bit	SCI Format		1
	Priority		As set by higher layers
	Resource reservation		0
	Modulation and coding scheme		Set as the PSSCH MCS specified in the test
	Retransmission index		Note 4
	Time gap between initial transmission and retransmission		0 (Note 2)
	Frequency resource location of the initial transmission and retransmission		Initial transmission: Set as per PSSCH RB allocation specific in the test Retransmission: Note 4
	Reserved bits		Set all these bits to 0
Transport block CRC		Bits	16
Binary Channel Bits (see Note 3)		Bits	432

Note 1: PSCCH transmissions are rate-matched for 10 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.

Note 2: SF_{gap} is the value indicated by "Time gap between initial transmission and retransmission" field in the configured sidelink grant, and SF_{gap} =0 means no retransmission of the associated TB as per TS 36.213.

Note 3: Binary channel bits calculated under assumption of 9 DFT-OFDM symbols per subframe.

Note 4: UE is allowed to autonomously select the un-used or redundant bits/code-points in SCI format 1.

Table A.11.3-2: PSSCH Reference Measurement Channels

Parameter	Unit	Value
Reference channel		CD.1
Sidelink transmission mode		4
Channel bandwidth	MHz	10
Allocated PSSCH resource blocks		3
DFT-OFDM symbols per subframe (see Note 1)		9
Modulation		QPSK
Target Code Rate		1/3
Information Bit Payload (Transport block size)	Bits	208
Transport block CRC	Bits	24
Number of PSSCH HARQ retransmissions		0
Binary Channel Bits (see Note 2)	Bits	648

Note1: PSSCH transmissions are rate-matched for 10 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.

Note 2: Binary channel bits calculated under assumption of 9 DFT-OFDM symbols per subframe.

A.12 V2X sidelink communication

A.12.1 Introduction

This clause also defines the principle and the reference configurations that are applicable to test cases verifying RRM core requirements for V2X sidelink communication.

A.12.2 Reference resource pool configurations for V2X Sidelink Communication

Table A.12.2-1: Pre-configuration for V2X Sidelink Communication (Configuration #1)

Derivation Path: TS 36.331 [3] clause 9.3.2, SL-V2X-Preconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE {			
sl-OffsetIndicator-r14	0	Indicates the offset of the first subframe of a resource pool within a SFN cycle. If absent, the resource pool starts from first subframe of SFN=0.	
sl-Subframe-r14 included in SL-PreconfigV2X-TxPoolList	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111	Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23])	
sl-Subframe-r14 included in SL-PreconfigV2X-RxPoolList	11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111 11111111111111111111	Indicates the bitmap of the RX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23])	
adjacencyPSCCH-PSSCH-r14	True	Adjacent: TRUE Non-adjacent: FALSE	
sizeSubchannel-r14	5	Minimum bandwidth of subchannel for adjacent transmission	
startRB-Subchannel-r14	0	Indicates the lowest RB index of the subchannel with the lowest index.	
startRB-PSCCH-Pool-r14	0	Indicates the lowest RB index of the PSCCH pool	
}			

Table A.12.2-2: V2X sidelink Communication configuration for E-UTRAN (Configuration #2)

Derivation Path: 36.331 clause 6.3.8				
Information Element			**Value (10MHz)**	**Comment**
SL-V2X-InterFreqUE-Config-r14 ::= SEQUENCE {				
	physCellIdList-r14			Not present
	typeTxSync-r14		*Set according to the specific test configuration*	ENUMERATED {gnss, enb, ue}
	v2x-SyncConfig-r14			Not present
	v2x-CommRxPool-r14	SL-CommResourcePoolV2X -r14 SEQUENCE {		RxPool A monitoring UE can receive on the resources of this pool when a transmitting UE uses the Tx Pool Normal or Tx Pool Exceptional
		sl-OffsetIndicator-r14	0	small-r12 Indicates the offset of the first subframe of a resource pool within a SFN cycle. If absent, the resource pool starts from first subframe of SFN=0.
		sl-Subframe-r14	11111111 11111111 1111	bs20-r14 for FDD Indicates the bitmap of the TX resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23])
		adjacencyPSCCH-PSSCH-r14	TRUE	BOOLEAN Adjacent: TRUE Non-adjacent: FALSE
		sizeSubchannel-r14	50	ENUMERATED {n50} Minimum bandwidth of subchannel for adjacent transmission
		numSubchannel-r14	1	ENUMERATED {n1} Number of subchannel for adjacent transmission
		startRB-Subchannel-r14	0	Indicates the lowest RB index of the subchannel with the lowest index.
		startRB-PSCCH-Pool-r14	0	Indicates the lowest RB index of the PSCCH pool
		}		
	v2x-CommTxPoolNormal-r14	SL-CommResourcePoolV2X -r14 SEQUENCE {		Tx Pool Normal

		sl-OffsetIndicator-r14	0	small-r12
		sl-Subframe-r14	11111111 11111111 0000	bs20-r14
		adjacencyPSCCH-PSSCH-r14	TRUE	BOOLEAN
		sizeSubchannel-r14	50	ENUMERATED {n50}
		numSubchannel-r14	1	ENUMERATED {n1}
		startRB-Subchannel-r14	0	
		startRB-PSCCH-Pool-r14	0	
		dataTxParameters-r14 SEQUENCE {		
		alpha-r12	al0	Sidelink power control: al0 corresponds to 0
		p0-r12	31	INTEGER (-126..31), unit dBm
		}		
		}		
	v2x-CommTxPoolExceptional-r14	SL-CommResourcePoolV2X -r14 SEQUENCE {		Tx Pool Exceptional
		sl-OffsetIndicator-r14	0	small-r12
		sl-Subframe-r14	00000000 00000000 1111	bs20-r14
		adjacencyPSCCH-PSSCH-r14	TRUE	BOOLEAN
		sizeSubchannel-r14	50	ENUMERATED {n50}
		numSubchannel-r14	1	ENUMERATED {n1}
		startRB-Subchannel-r14	0	
		startRB-PSCCH-Pool-r14	0	
		dataTxParameters-r14 SEQUENCE {		
		alpha-r12	al0	Sidelink power control: al0 corresponds to 0
		p0-r12	31	INTEGER (-126..31), unit dBm
		}		
		}		
	p2x-CommTxPoolNormal-r14			Not present
	v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14::= SEQUENCE {		
		pssch-TxConfigList-r14 ::= SEQUENCE {	SL-PSSCH-TxConfig-r14	
		typeTxSync-r14	*Set according to the specific test configuration*	ENUMERATED {gnss, enb, ue}
		thresUE-Speed-r14	kmph200	
		parametersAboveThres-r14 SEQUENCE {		
		minMCS-PSSCH-r14	0	
		maxMCS-PSSCH-r14	15	
		minSubChannel-NumberPSSCH-r14	1	
		maxSubchannel-NumberPSSCH-r14	1	
		allowedRetxNumberPSSCH-r14	Both	
		maxTxPower-r14	Not present	

		}		
		parametersBelowThres-r14 SEQUENCE {		
		minMCS-PSSCH-r14	4	
		maxMCS-PSSCH-r14	25	
		minSubChannel-NumberPSSCH-r14	1	
		maxSubchannel-NumberPSSCH-r14	1	
		allowedRetxNumberPSSCH-r14	n1	
		maxTxPower-r14	Not present	
		}		
		}		
		thresPSSCH-RSRP-List-r14 SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14 {		
		SL-ThresPSSCH-RSRP-r14[n]	1	For n=1,2,…,64, where n denotes the index for the threshold used for sensing based UE autonomous resource selection
		}		
		restrictResourceReservationPeriod-r14	{v1}	BIT STRING (SIZE (10))
		probResourceKeep-r14	v0	
		}		
	zoneConfig-r14			Not present
}				

A.12.3 Reference measurement channels for V2X Sidelink Communication

Table A.12.3-1: PSCCH Reference Measurement Channels

Parameter		Unit	Value
Reference channel			CC.1A HD
Channel bandwidth		MHz	10
Allocated PSCCH resource blocks			2
DFT-OFDM symbols per subframe (see Note 1)			9
Modulation			QPSK
Information Bit Payload (without CRC)		Bits	32
Information Bit	SCI Format		1
	Priority		As set by higher layers
	Resource reservation		0
	Modulation and coding scheme		Set as the PSSCH MCS specified in the test
	Retransmission index		Note 4
	Time gap between initial transmission and retransmission		0 (Note 3)
	Frequency resource location of the initial transmission and retransmission		Initial transmission: Set as per PSSCH RB allocation specific in the test Retransmission: Note 4
	Reserved bits		Set all these bits to 0

Transport block CRC	Bits	16
Binary Channel Bits (see Note 2)	Bits	432
Note 1: PSCCH transmissions are rate-matched for 10 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211. Note 2: Binary channel bits calculated under assumption of 9 DFT-OFDM symbols per subframe. Note 3: SFgap is the value indicated by "Time gap between initial transmission and retransmission" field in the configured sidelink grant, and SFgap =0 means no retransmission of the associated TB as per TS 36.213. Note 4: UE is allowed to autonomously select the un-used or redundant bits/code-points in SCI format 1		

Table A.12.3-2: PSSCH Reference Measurement Channels

Parameter	Unit	Value
Reference channel		CD.1A HD
Sidelink transmission mode		4
Channel bandwidth	MHz	10
Allocated PSSCH resource blocks		48
DFT-OFDM symbols per subframe (see Note 1)		9
Modulation		QPSK
Target Code Rate		1/3
Information Bit Payload (Transport block size)	Bits	3496
Transport block CRC	Bits	24
Number of PSSCH HARQ retransmissions		0
Binary Channel Bits (see Note 2)	Bits	10368
Note 1: PSSCH transmissions are rate-matched for 10 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211. Note 2: Binary channel bits calculated under assumption of 9 DFT-OFDM symbols per subframe.		

Table A.12.3-3: PSSCH Reference Measurement Channels

Parameter	Unit	Value
Reference channel		CD.1B HD
Sidelink transmission mode		4
Channel bandwidth	MHz	10
Allocated PSSCH resource blocks		3
DFT-OFDM symbols per subframe (see Note 1)		9
Modulation		QPSK
Target Code Rate		1/3
Information Bit Payload (Transport block size)	Bits	208
Transport block CRC	Bits	24
Number of PSSCH HARQ retransmissions		0
Binary Channel Bits (see Note 2)	Bits	648
Note 1: PSSCH transmissions are rate-matched for 10 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211. Note 2: Binary channel bits calculated under assumption of 9 DFT-OFDM symbols per subframe.		

Annex B (normative): Propagation Conditions

B.0 No interference

See TS 36.521-1 [10] Annex B.0.

B.1 Static propagation condition

See TS 36.521-1 [10] Annex B.1 and B.1.1

B.2 Multi-path fading Propagation Conditions

See TS 36.521-1 [10] Annex B.2,B.2.1 and B.2.2

Annex C (normative): Downlink Physical Channels

C.0 Downlink signal

See TS 36.521-1 [10] Annex C.0.

C.1 General

See TS 36.521-1 [10] Annex C.1.

For CA tests with 1 UL, no PHICH resources are assigned to the DUT in the SCell. In such case PHICH of SCell is entirely part of OCNG pattern used.

C.2 Set-up

See TS 36.521-1 [10] Annex C.2.

C.3 Test specific scenarios

C.3.1 ABS Transmission Configurations

C.3.1.1 Non-MBSFN ABS Transmission Configurations

C.3.1.1.1 Non-MBSFN ABS Transmission, 1x2 antenna with PBCH

Table C.3.1.1.1-1: Transmission configuration with non-MBSFN ABS, 1x2 with PBCH

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	0	0
	PBCH_RB	0	0
PSS	PSS_RA	0	0
SSS	SSS_RA	0	0
PCFICH	PCFICH_RB	0	0 (Note 1)
PHICH	PHICH_RA	0	-Inf
	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	0 (Note 1)
	PDCCH_RB	0	0 (Note 1)
PDSCH	PDSCH_RA	0	0 (Note 1)
	PDSCH_RB	0	0 (Note 1)
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE 1: Only used for SIB1, otherwise EPRE is –Inf NOTE 2: 1x2 antenna configuration is assumed			

C.3.1.1.2 Non-MBSFN ABS Transmission, 2x2 antenna without PBCH

Table C.3.1.1.2-1: Transmission configuration #1 with non-MBSFN ABS, 2x2 without PBCH

Physical Channels and Signals	Parameters	EPRE [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	1	-Inf
	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table C.3.1.1.2-2: Transmission configuration #2 with non-MBSFN ABS, 2x2 without PBCH

Physical Channels and Signals	Parameters	EPRE [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	-3	-Inf
	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

C.3.1.2 MBSFN ABS Transmission Configurations

C.3.1.2.1 MBSFN ABS Transmission, 1x2 antenna

Table C.3.1.2.1-1: Transmission configuration with MBSFN ABS, 1x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	0	N/A
	PBCH_RB	0	N/A
PSS	PSS_RA	0	N/A
SSS	SSS_RA	0	N/A
PCFICH	PCFICH_RB	0	-Inf
PHICH	PHICH_RA	0	-Inf
	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	-Inf
	PDCCH_RB	0	-Inf
PDSCH	PDSCH_RA	0	-Inf
	PDSCH_RB	0	-Inf
PMCH	PMCH_RA	0	-Inf
	PMCH_RB	0	-Inf
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE: 1x2 antenna configuration is assumed			

C.3.1.2.2 MBSFN ABS Transmission, 2x2 antenna

Table C.3.1.2.2-1: Transmission configuration #1 with MBSFN ABS, 2x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	1	-Inf
	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table C.3.1.2.2-2: Transmission configuration # 2 with MBSFN ABS, 2x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	-3	-Inf
	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

C.3.2 Impact of Reference Sensitivity Degradation with Carrier Aggregation on Test Cases

C.3.2.1 Impact of Reference Sensitivity Degradation due to Insertion Loss

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c}$>0 dB as defined in TS 36.101 [2], 7.3.1-1A, there is no adjustment of test parameters in the tests specified in TS 36.133 when $\Delta R_{IB,c} \leq 1$ dB.

C.3.3 Carrier Aggregation Test Cases with Different Channel Bandwidth Combinations

C.3.3.1 Introduction

In clauses 7, 8 and 9 carrier aggregation test cases may be defined with different channel bandwidth combinations to verify the same RRM requirement.

If multiple carrier aggregation test cases with different channel bandwidth combinations are defined to verify the same RRM requirement that is channel bandwidth independent, then the UE needs to be tested only with one bandwidth combination out of the bandwidth combination sets supported by that UE.

C.3.4 Proximity-based Services

C.3.4.1 Introduction

This clause also defines the principle and the reference configurations that are applicable to test cases verifying RRM core requirements for ProSe Direct Discovery and ProSe Direct Communication.

C.3.4.2 Reference DRX configurations for ProSe tests

Table C.3.4.2-1: Reference DRX Configurations

Parameter	Value
Reference configuration	DRX_P1
onDurationTimer	psf1
drx-InactivityTimer	psf1
drx-RetransmissionTimer	psf1
longDRX-CycleStartOffset	sf320, 0
shortDRX	Disabled
Note: For further information see clause 6.3.2 in TS 36.331.	

C.3.4.3 Test Cases with Different Channel Bandwidths

C.3.4.3.1 Introduction

This clause defines a principle which is applicable to test cases verifying ProSe RRM requirements with different channel bandwidths.

C.3.4.3.2 Principle of testing

Some ProSe test cases are defined for different channel bandwidths to verify the same RRM requirement.

If test cases with different channel bandwidth are defined to verify the same RRM requirement then the UE is required to pass the test cases only with one of the channel bandwidths.

C.3.5 Listen before talk model

C.3.5.1 Introduction

In some RRM test cases for FS3, a listen before talk (LBT) model is specified. The intention of the LBT model is to emulate using test equipment the behaviour of an FS3 eNB which performs channel measurement to check that the channel is clear prior to performing downlink transmission.

C.3.5.2 Definition

Prior to each DMTC window, the test equipment shall determine whether to transmit a discovery reference signal (DRS) during the DMTC window with probability P=0.75. In many cases the test requirement depends on the number of configured discovery signal occasions which are not available during the test, so the test equipment shall track how many DRS are not transmitted during the test period. If the test equipment determines that it shall transmit a DRS, then the timing of the DRS transmission within the DMTC window is randomly selected from the set of possible DRS transmission signal timings, such that there is an equal probability of any valid DRS timing.

For non DRS downlink transmission bursts, if transmission occurred in the previous subframe, transmission is muted for a duration of one subframe. Additionally, if the start time of the candidate transmission burst is within [8] subframes of the start of the DMTC window, transmission is not performed. Otherwise

The length of the transmission burst in subframes is defined as N. The burst transmission format is determined according to the steps below:

1. Select N randomly from a given set of the number of subframes S_1={1,3,5,8} with equal probability as the total length of burst transmission format.

2. A uniform random variable from 0 to 1 is generated. If the random variable is less than P=0.75, a burst of N fully occupied subframes is transmitted. Otherwise, the burst transmission is muted and the muting duration is the same as the number N of subframes for determined burst format.

Annex D (normative): OFDMA Channel Noise Generator (OCNG)

D.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a constant transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframes is the maximal allowed according to 3GPP TS 36.213 [8]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

D.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 - 12	0	0	0	N/A	Note 1	N/A
37 - 49	0	0	0	N/A		
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

Note 5: If SPDCCH is to be transmitted on a physical resource block (PRB), this takes priority over OCNG transmission.

N/A: Not Applicable

D.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Table D.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data	PMCH Data
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		
0 - 49	0	0	0	N/A	Note 1	N/A
0 - 49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.1.3-1: OP.3 FDD: OCNG FDD Pattern 3

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 - 1	0	0	0	N/A	Note 1	N/A
4 - 5	0	0	0	N/A		
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data	PMCH Data
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		
0 - 5	0	0	0	N/A	Note 1	N/A
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

Table D.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 12	0	0	0	N/A	Note 2
37 - 49	0	0	0	N/A	
0 - 49	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)

Table D.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.

The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Table D.1.7-1: OP.7 FDD: OCNG FDD Pattern 7

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 5	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.

The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.8 OCNG FDD pattern 8: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table D.1.8-1: OP.8 FDD: OCNG FDD Pattern 8

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4,9	(1-3, 6-8)[Note4]	
0 – 12	0	0	0	N/A	Note 2
37 – 49	0	0	0	N/A	
0 – 49	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 4: The subframe(s) configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
N/A: Not Applicable

D.1.9 OCNG FDD pattern 9: full bandwidth allocation in 10 MHz for MBSFN ABS

Table D.1.9-1: OP.9 FDD: OCNG FDD Pattern 9

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	(1-3, 6-8)[Note4]	
0 – 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 4: The subframe(s) configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
N/A: Not Applicable

D.1.10 OCNG FDD pattern 10: outer resource blocks allocation in 10 MHz with user data in every SF (without MBSFN)

Table D.1.10-1: OP.10 FDD: OCNG FDD Pattern 10

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 12	0	0	0	0	Note 2
37 - 49	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.

The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.11 OCNG FDD pattern 11: outer resource blocks allocation in 20 MHz

Table D.1.11-1: OP.11 FDD: OCNG FDD Pattern 11

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 – 37	0	0	0	N/A	Note 1	N/A
62 – 99	0	0	0	N/A		
0-99	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.12 OCNG FDD pattern 12: full bandwidth allocation in 20 MHz

Table D.1.12-1: OP.12 FDD: OCNG FDD Pattern 12

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data	PMCH Data
	Subframe					
	0	5	4, 9	1 – 3, 6 – 8		
0 – 99	0	0	0	N/A	Note 1	N/A
0 – 99	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.13 OCNG FDD pattern 13: outer resource blocks allocation in 20 MHz (without MBSFN)

Table D.1.13-1: OP.13 FDD: OCNG FDD Pattern 13

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4,9	1-3, 6-8	
0 – 37	0	0	0	N/A	Note 2
62 – 99	0	0	0	N/A	
0 – 99	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.14 OCNG FDD pattern 14: full bandwidth allocation in 20 MHz (without MBSFN)

Table D.1.14-1: OP.14 FDD: OCNG FDD Pattern 14

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 – 3, 6 – 8	
0 – 99	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.15 OCNG FDD pattern 15: outer resource blocks allocation in 5 MHz

Table D.1.15-1: OP.15 FDD: OCNG FDD Pattern 15

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data	PMCH Data
	Subframe					
	0	5	4,9	1-3, 6-8		
0 – 6	0	0	0	N/A	Note 1	N/A
18 – 24	0	0	0	N/A		
0-24	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

D.1.16 OCNG FDD pattern 16: full bandwidth allocation in 5 MHz

Table D.1.16-1: OP.16 FDD: OCNG FDD Pattern 16

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 – 3, 6 – 8		
0 – 24	0	0	0	N/A	Note 1	N/A
0 – 24	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

D.1.17 OCNG FDD pattern 17: outer resource blocks allocation in 20 MHz with user data in every subframe (without MBSFN)

Table D.1.17-1: OP.17 FDD: OCNG FDD Pattern 17

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 37	0	0	0	0	Note 2
62 - 99	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable.

D.1.18 OCNG FDD pattern 18: outer resource blocks allocation in 5 MHz (without MBSFN)

Table D.1.18-1: OP.18 FDD: OCNG FDD Pattern 18

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4,9	1-3, 6-8	
0 – 6	0	0	0	N/A	Note 2
18 – 24	0	0	0	N/A	
0 – 24	N/A	N/A	N/A	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable

D.1.19 OCNG FDD pattern 19: full bandwidth allocation in 5 MHz (without MBSFN)

Table D.1.19-1: OP.19 FDD: OCNG FDD Pattern 19

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 – 3, 6 – 8	
0 – 24	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable

D.1.20 OCNG FDD pattern 20: outer resource blocks allocation in 5 MHz with user data in every subframe (without MBSFN)

Table D.1.20-1: OP.20 FDD: OCNG FDD Pattern 20

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 6	0	0	0	0	Note 2
18 - 24	0	0	0	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable.

D.1.21 OCNG FDD pattern 21: Generic resource blocks allocation (without MBSFN)

Table D.1.21-1: OP.21 FDD: OCNG FDD Pattern 21

OCNG Pattern Name	Bandwidth (MHz)	Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
			Subframe				
			0	5	4, 9	1 – 3, 6 – 8	
OP.21 FDD	10	0 – 49 Note 1,2	0	0	0	0	Note 3

Note 1: The OCNG pattern is used only for a serving cell of the UE under test.

Note 2: The OCNG allocation applied to all downlink physical resource blocks (PRBs) except the REs that are allocated for the PDSCH for the UE under test.

Note 3: OCNG PRBs are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 4: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

D.2 OCNG Patterns for TDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test). The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframes is the maximal allowed according to 3GPP TS 36.213 [8]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

D.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3, 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 12	0	0	0	0	Note 2
37 - 49	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 5: If SPDCCH is to be transmitted on a physical resource block(PRB), this takes priority over OCNG transmission.

D.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz

Table D.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table D.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 1	0	0	0	0	Note 2
4 - 5	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9].

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz

Table D.2.4-1: OP.4 TDD: OCNG TDD Pattern 4 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 5	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [9].

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.5 OCNG TDD pattern 5: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table D.2.5-1: OP.5 TDD: OCNG TDD Pattern 5 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 12	0	0	0	Table D.2.5-2	Note 2
37 – 49	0	0	0		

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Table D.2.5-2: OP.5 TDD: OCNG TDD Pattern 5 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 12	N	0		0		0		0		0		0		0		0		0	
37 – 49	N	0		0		0		0		0		0		0		0		0	
Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].																			

D.2.6 OCNG TDD pattern 6: full bandwidth allocation in 10 MHz for MBSFN ABS

Table D.2.6-1: OP.6 TDD: OCNG TDD Pattern 6 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe)Note 3	1 and 6 (as special subframe) Note 3	
0 – 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

D.2.7 OCNG TDD pattern 7: outer resource blocks allocation in 20 MHz

Table D.2.7-1: OP.7 TDD: OCNG TDD Pattern 7 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 37	0	0	0	Table D.2.7-2	Note 2
62 – 99	0	0	0		

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table D.2.7-2: OP.7 TDD: OCNG TDD Pattern 7 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]															
		Special subframe configuration															
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 37	N	0		0		0		0		0		0		0		0		0	
62 – 99	N	0		0		0		0		0		0		0		0		0	

Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].

D.2.8 OCNG TDD pattern 8: full bandwidth allocation in 20 MHz

Table D.2.8-1: OP.8 TDD: OCNG TDD Pattern 8 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe)Note 3	1 and 6 (as special subframe) Note 3	

0 – 99	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.9 OCNG TDD pattern 9: outer resource blocks allocation in 5 MHz

Table D.2.9-1: OP.9 TDD: OCNG TDD Pattern 9 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 6	0	0	0	Table A.3.2.1.7-2	Note 2
18 – 24	0	0	0		

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table D.2.9-2: OP.9 TDD: OCNG TDD Pattern 9 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**CP length**	**Relative power level** γ_{PRB} **[dB]**																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 6	N	0		0		0		0		0		0		0		0		0	
18 – 24	N	0		0		0		0		0		0		0		0		0	

Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].

D.2.10 OCNG TDD pattern 10: full bandwidth allocation in 5 MHz

Table D.2.10-1: OP.10 TDD: OCNG TDD Pattern 10 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 24	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.11 OCNG TDD pattern 11: Generic resource blocks allocation (without MBSFN)

Table D.2.11-1: OP.11 TDD: OCNG TDD Pattern 11

OCNG Pattern Name	Bandwidth (MHz)	Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
			Subframe				
			0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 5	1 and 6 (as special subframe) Note 5	
OP.11 TDD	10	0 – 49 Note 1,2	0	0	0	0	Note 3

Note 1: The OCNG pattern is used only for a serving cell of the UE under test.
Note 2: The OCNG allocation applied to all downlink physical resource blocks (PRBs) except the REs that are allocated for the PDSCH for the UE under test.
Note 3: OCNG PRBs are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 4: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 5: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16]

D.3 OCNG Patterns for Narrowband IoT

The following Narrowband OCNG patterns (NOCNG) are used for modelling allocations to UEs not under test in a Narrowband IoT cell. Depending on scenario, allocations may be for UEs of category NB1only, or for UEs of category NB1 as well as of other categories. The former is applicable to guard-band and stand-alone deployments of Narrowband IoT, whereas the latter is applicable to in-band deployment. In order to allow different power levels for the LTE cell and the Narrowband IoT cell, a distinction is made between OCNG and NOCNG where the latter is used for category NB1 UEs and the former is used for other UE categories.

OCNG in the LTE cell is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH-to-RS EPRE ratio in OFDM symbols with and without LTE cell-specific reference symbols, respectively. The relative power, which is used for modelling boosting per virtual LTE UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual LTE UE.

Moreover in each test case NOCNG is expressed by parameters NOCNG_RA and NOCNG_RB which together with a relative power level (γ) specifies the <channel>-to-RS EPRE ratio in OFDM symbols with and without Narrowband reference symbols (NB-RS), respectively. The relative power, which is used for modelling boosting per virtual UE category NB1 allocation, is expressed by:

$$\gamma_k = <channel>_k\_RA / NOCNG\_RA = <channel>_k\_RB / NOCNG\_RB,$$

where γ_k denotes the relative power level of the *k:th* virtual NB-IoT UE, and channel may be either of NPDCCH and NPDSCH.

The parameter settings of OCNG_RA, OCNG_RB, NOCNG_RA, NOCNG_RB and the set of relative power levels γ are chosen such that when also taking allocations to the UE category NB1 under test into account, as given by a NPDCCH and NPDSCH reference channels, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

D.3.1 Narrowband IoT OCNG FDD pattern 1: In-band NB-IoT in 10 MHz EUTRAN cell

Table D.3.1-1: NOP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]			PDSCH Data	NPDCCH and NPDSCH Data
	Subframe				
	0, 4	5, 9	1-3, 6-8		
0 – (*nCell[1]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[1]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[1]RB +1) – (*nCell[…]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[…]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[...]RB +1) – (*nCell[N]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[N]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[N]RB+1) – 49 (Note 5)	0	0	0	Note 1	N/A

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS, and NPBCH in anchor cell.

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

Note 5: *nCell[k]RB* is the index of the RB used for allocation of the NB-IoT cell *k* with *k = {1, .., N}* with *N* the total number of the NB-IoT cells belonging to the same LTE donor cell as specified in the individual tests.

N/A: Not Applicable

D.3.2 Narrowband IoT OCNG FDD pattern 2: guard band NB-IoT in 10 MHz EUTRAN cell

Table D.3.2-1: NOP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**PDSCH Data**	**NPDCCH and NPDSCH Data**
	Subframe				
	0, 4	5, 9	1-3, 6-8		
0-49	0	0	0	Note 1	N/A
50	0	0 (Note 3)	0	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and PBCH in anchor cell (n_{PRB} = 50).

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

N/A: Not Applicable

D.3.3 Narrowband IoT OCNG FDD pattern 3: standalone NB-IoT

Table D.3.3-1: NOP.3 FDD: OCNG FDD Pattern 3

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**NPDCCH and NPDSCH Data**
	Subframe			
	0, 4	5, 9	1-3, 6-8	
0	0 (Note 2)	0 (Note 2)	0	Note 1

Note 1: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and PBCH in anchor cell (n_{PRB} = 0).

Note 3: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over NOCNG.

D.3.4 Narrowband IoT OCNG FDD pattern 4: In-band NB-IoT in 5 MHz EUTRAN cell

Table D.3.4-1: NOP.4 FDD: OCNG FDD Pattern 4

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**PDSCH Data**	**NPDCCH and NPDSCH Data**
	Subframe				
	0, 4	5, 9	1-3, 6-8		
0 – (*nCell[1]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[1]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[1]RB +1) – (*nCell[…]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[…]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[...]RB +1) – (*nCell[N]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[N]RB (Note 5)	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[N]RB+1) – 24 (Note 5)	0	0	0	Note 1	N/A

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS, and NPBCH in anchor cells.

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

Note 5: *nCell[k]RB* is the index of the RB used for allocation of the NB-IoT cell *k* with *k = {1, .., N}* with *N* the total number of the NB-IoT cells belonging to the same LTE donor cell as specified in the individual tests.

N/A: Not Applicable

D.3.5 Narrowband IoT OCNG FDD pattern 5: guard band NB-IoT in 5 MHz EUTRAN cell

Table D.3.5-1: NOP.5 FDD: OCNG FDD Pattern 5

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**PDSCH Data**	**NPDCCH and NPDSCH Data**
	Subframe				
	0, 4	5, 9	1-3, 6-8		
0 – 24	0	0	0	Note 1	N/A
25	0 (Note 3)	0 (Note 3)	0	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and PBCH in anchor cell (n_{PRB} = 25).

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

N/A: Not Applicable

D.3.6 Narrowband IoT OCNG TDD pattern 1: In-band NB-IoT in 10 MHz EUTRAN cell

Table D.3.6-1: NOP.1 TDD: OCNG TDD Pattern 1 for uplink-downlink configurations 1 and 2

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]			PDSCH Data	NPDCCH and NPDSCH Data
	Subframe				
	0, 5, 9	1, 6[Note 7]	3, 4, 8[Note 4]		
0 – (*nCell[1]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[1]RB (Note 5)	0 (Note 3)	0	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[1]RB +1) – (*nCell[…]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[…]RB (Note 5)	0 (Note 3)	0	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[...]RB +1) – (*nCell[N]RB -1*) (Note 5)	0	0	0	Note 1	N/A
nCell[N]RB (Note 5)	0 (Note 3)	0	N/A	N/A	Note 2
	N/A	N/A	0	Note 1	N/A
(nCell[N]RB+1) – 49 (Note 5)	0	0	0	Note 1	N/A

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS, and NPBCH in anchor cells.

Note 4: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16].

Note 5: *nCell[k]RB* is the index of the RB used for allocation of the NB-IoT cell *k* with *k = {1, .., N}* with *N* the total number of the NB-IoT cells belonging to the same E-UTRA donor cell as specified in the individual tests.

Note 6: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

Note 7: Whether NPDSCH transmissions are carried out in DwPTS depends on the special subframe configuration in use.

N/A: Not Applicable

D.3.7 Narrowband IoT OCNG TDD pattern 2: guard band NB-IoT in 10 MHz EUTRAN cell

Table D.3.7-1: NOP.2 TDD: OCNG TDD Pattern 2 for uplink-downlink configurations 1 and 2

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]			PDSCH Data	NPDCCH and NPDSCH Data
	Subframe				
	0, 5, 9	1, 6[Note 6]	3, 4, 8[Note 4]		
0-49	0	0	0	Note 1	N/A
50	0 (Note 3)	0	0	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and NPBCH in anchor cell (n_{PRB} = 50).

Note 4: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16].

Note 5: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

Note 6: Whether NPDSCH transmissions are carried out in DwPTS depends on the special subframe configuration in use.

N/A: Not Applicable

D.3.8 Narrowband IoT OCNG TDD pattern 3: standalone NB-IoT

Table D.3.8-1: NOP.3 TDD: OCNG TDD Pattern 3 for uplink-downlink configurations 1 and 2

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]			NPDCCH and NPDSCH Data
	Subframe			
	0, 5, 9	1, 6[Note 5]	3, 4, 8[Note 3]	
0	0 (Note 2)	0	0	Note 1

Note 1: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and NPBCH in anchor cell (n_{PRB} = 0).

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16].

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over NOCNG.

Note 5: Whether NPDSCH transmissions are carried out in DwPTS depends on the special subframe configuration in use.

D.4 OCNG Patterns for V2X sidelink

The following V2X sidelink OCNG patterns (VOCNG) are used for modelling allocations to virtual V2X UEs (which are not under test). The OCNG pattern for each subframe specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case VOCNG is expressed by parameters VOCNG_RA and VOCNG_RB which together with a relative power level (γ) specifies the PSSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference symbols, respectively. The relative power, which is used for modelling boosting per virtual V2X UE allocation, is expressed by:

$$\gamma_i = PSSCH_i\_RA / VOCNG\_RA = PSSCH_i\_RB / VOCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual V2X UE. The parameter settings of VOCNG_RA, VOCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PSSCH reference channel.

Moreover the VOCNG pattern is accompanied by a PSCCH reference channel which specifies the control region. The number of PSCCH OFDM symbols in all subframes is the same as specified in the RMC used in the test.

D.4.1 V2X sidelink OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.4.1-1: VOP.1 HD: OCNG TDD Pattern 1

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]	PSCCH and PSSCH Data
	Subframe Note 2	
	0 - 19	
0 – 4	18	Note 1
10–25	18	

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PSSCH per virtual UE; the data transmitted over the OCNG PSSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PSSCH.

Note 2: Value of γ_{PRB} is applicable to subframes not used for V2X sidelink transmissions.

D.4.2 V2X sidelink OCNG TDD pattern 2: outer resource blocks allocation in 10 MHz

Table D.4.2-1: VOP.2 HD: OCNG TDD Pattern 2

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]	PSCCH and PSSCH Data
	Subframe Note 2	
	0 - 19	
0 – 4	18	Note 1
10-14	18	
15 –19	8.1	
20–25	18	

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PSSCH per virtual UE; the data transmitted over the OCNG PSSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PSSCH.

Note 2: Value of γ_{PRB} is applicable to subframes not used for V2X sidelink transmissions.

Annex E (normative): Cell configuration mapping

The cells used in TS 36.521-3 do not correspond to the cells defined in TS 36.508 [7] section 4.4.2. Tables E-1, E-2, E-3, E-5, E-6, E-7 and E-8 describes the mapping between cells described in TS 36.521-3 and those defined in TS 36.508 [7]. Table E-4 describe the mapping between Ncells described in TS 36.521-3 and those defined in TS 36.508 [7] For each test case the cells as defined in TS 36.508 [7] section 4.4.2 and section 8.1.4.2 are listed in one row. The test case shall apply the RF parameters as defined in TS 36.521-3 according to the column heading.

NOTE: For example if the second cell in a test case is an inter-frequency cell then Cell3 from TS 36.508 [7] section 4.4.2 is used with the radio parameters as defined for Cell2 in TS 36.521-3.

Table E-1: Cell configuration mapping for RRM testing

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
4.2.1	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection intra frequency case	Cell1	Cell11			
4.2.2	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection intra frequency case	Cell1	Cell11			
4.2.3	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection inter frequency case	Cell6	Cell23			
4.2.4	RRC IDLE / E-UTRAN Cell Reselection / FDD - TDD cell re-selection inter frequency case	Cell1	Cell31	Dual mode in single PLMN		
4.2.5	RRC IDLE / E-UTRAN Cell Reselection / TDD - FDD cell re-selection inter frequency case	Cell31	Cell1			
4.2.6	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection inter frequency case	Cell6	Cell23			
4.2.7	RRC IDLE / E-UTRAN Cell Reselection / FDD – FDD Inter frequency case in the existence of non-allowed CSG cell	Cell23	Cell6	Cell3		
4.2.8	RRC IDLE / E-UTRAN Cell Reselection / TDD – TDD Inter frequency case in the existence of non-allowed CSG cell	Cell23	Cell6	Cell3		
4.2.9	RRC IDLE / E-UTRAN Cell Reselection / E-UTRAN FDD-FDD intra-frequency Cell Re-selection case for 5MHz Bandwidth	Cell1	Cell11			
4.2.10	E-UTRAN FDD – FDD reselection using an increased number of carriers	Cell6	(Note 9)	(Note 10) (Note15)	(Note 10) (Note15)	
4.2.11	E-UTRAN TDD – TDD reselection using an increased number of carriers	Cell6	(Note 9)	(Note 10) (Note15)	(Note 10) (Note15)	
4.2.12	E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11			
4.2.13	E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11			
4.2.14	E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11			
4.2.15	E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11			
4.2.16	E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11			
4.2.17	E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11			
4.2.20	E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis	Cell1	Cell11			
4.2.21	E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis	Cell1	Cell11			
4.2.22	E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Cell1	Cell11			
4.2.23	E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Cell1	Cell11			
4.3.1.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of higher priority	Cell3	Cell9			
4.3.1.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of lower priority	Cell3	Cell9			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
4.3.1.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	Cell3	Cell9			
4.3.1.4	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz Bandwidth	Cell3	Cell9			
4.3.1.5	Idle mode FDD to UTRA FDD interRAT reselection	Cell6	(Note11)	(Note14) (Note15)		
4.3.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN TDD cell re-selection	Cell6	Cell8			
4.3.2A	E-UTRA FDD to UTRA TDD cell re-selection for IncMon	Cell6	(Note11)	(Note 16) (Note15)		
4.3.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN FDD cell re-selection	Cell6	Cell8			
4.3.3A	Idle mode TDD to UTRA FDD interRAT reselection	Cell6	(Note11)	(Note 14) (Note 15)		
4.3.4.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of higher priority	Cell6	Cell8			
4.3.4.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority	Cell6	Cell8			
4.3.4.4	E-UTRA TDD to UTRA TDD cell re-selection for IncMon	Cell6	(Note11)	(Note 16) (Note 15)		
4.3.4.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection /EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	Cell3	Cell9			
4.4.1	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN FDD - GSM cell re-selection	Cell1	Cell26			
4.4.2	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN TDD - GSM cell re-selection	Cell1	Cell26			
4.5.1.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	Cell1	Cell15			
4.5.2.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Cell1	Cell15			
4.6.1.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN FDD - cdma2000 1xRTT cell re-selection: cdma2000 1x is of lower priority	Cell1	Cell19			
4.6.2.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN TDD - cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	Cell1	Cell19			
5.1.1	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Intra frequency case	Cell1	Cell2			
5.1.2	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Intra frequency case	Cell1	Cell2			
5.1.3	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case	Cell6	Cell3			
5.1.3_2	E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis	Cell6	Cell3			
5.1.4	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case	Cell6	Cell3			
5.1.4_2	E-UTRAN TDD – TDD Inter frequency handover for UE Category 1bis	Cell6	Cell3			
5.1.5	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case: unknown target cell	Cell6	Cell3			
5.1.5_2	E-UTRAN FDD – FDD Inter frequency handover: unknown target cell for UE Category 1bis	Cell6	Cell3			
5.1.6	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case: unknown target cell	Cell6	Cell3			
5.1.6_2	E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell for UE Category 1bis	Cell6	Cell3			
5.1.7	RRC CONNECTED / E-UTRAN Handover / FDD – TDD / Inter frequency case	Cell1	Cell10	Dual mode in multiple PLMN		
5.1.7_2	E-UTRAN FDD – TDD Inter frequency handover for UE Category 1bis	Cell1	Cell10	Dual mode in multiple PLMN		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
5.1.8	RRC CONNECTED / E-UTRAN Handover / TDD – FDD / Inter frequency case	Cell10	Cell1			
5.1.8_2	E-UTRAN TDD – FDD Inter frequency handover for UE Category 1bis	Cell10	Cell1			
5.1.9	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Intra frequency handover for 5MHz Bandwidth	Cell1	Cell2			
5.1.10	E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Cell1	Cell2			
5.1.11	E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Cell1	Cell2			
5.1.12	E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Cell1	Cell2			
5.1.13	E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2			
5.1.14	E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2			
5.1.15	E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2			
5.1.19	E-UTRAN FDD - FDD Intra frequency handover for UE Category 1bis	Cell1	Cell2			
5.1.20	E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis	Cell1	Cell2			
5.1.28	E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA	Cell6	Cell3			
5.1.34	E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA without SFN acquisition	Cell6	Cell3			
5.2.1	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN FDD handover	Cell3	Cell9			
5.2.2	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN FDD handover	Cell6	Cell8			
5.2.3	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRAN FDD - GSM handover	Cell1	Cell26			
5.2.4	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN TDD handover	Cell3	Cell9			
5.2.5	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN TDD handover	Cell6	Cell8			
5.2.6	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRA TDD - GSM handover	Cell1	Cell26			
5.2.7	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - UTRAN FDD handover: unknown target cell	Cell3	Cell9			
5.2.8	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - GSM handover: unknown target cell	Cell1	Cell26			
5.2.9	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - GSM Handover: unknown target cell	Cell1	Cell26			
5.2.10	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	Cell6	Cell8			
5.2.11	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth	Cell3	Cell9			
5.3.1	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	Cell1	Cell15			
5.3.2	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – cdma2000 1xRTT handover	Cell1	Cell19			
5.3.3	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD Handover: unknown target cell	Cell1	Cell15			
5.3.4	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD - cdma2000 1xRTT Handover: unknown target cell	Cell1	Cell19			
5.3.5	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN TDD-HRPD Handover	Cell1	Cell15			
5.3.6	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN TDD-cdma2000 1X Handover	Cell1	Cell19			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
6.1.1	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment	Cell1	Cell2			
6.1.1_2	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis	Cell1	Cell2			
6.1.2	RRC Connection Mobility Control / E-UTRAN FDD Inter-frequency RRC Re-establishment	Cell6	Cell3			
6.1.2_2	RRC Connection Mobility Control / E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis	Cell6	Cell3			
6.1.3	RRC Connection Mobility Control / E-UTRAN TDD Intra-frequency RRC Re-establishment	Cell1	Cell2			
6.1.3_2	RRC Connection Mobility Control / E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis	Cell1	Cell2			
6.1.4	RRC Connection Mobility Control / E-UTRAN TDD Inter-frequency RRC Re-establishment	Cell6	Cell3			
6.1.4_2	RRC Connection Mobility Control / E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis	Cell6	Cell3			
6.1.5	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Cell1	Cell2			
6.1.8	E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Cell1	Cell2			
6.1.9	E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2			
6.1.10	E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2			
6.1.11	E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2			
6.1.12	E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2			
6.1.13	E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2			
6.1.14	E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2			
6.1.18	E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA	Cell6	Cell3			
6.2.1	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access	Cell1				
6.2.1_2	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access for UE Category 1bis	Cell1				
6.2.2	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access	Cell1				
6.2.2_2	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access for UE Category 1bis	Cell1				
6.2.3	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Contention Based Random Access	Cell1				
6.2.3_2	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Contention Based Random Access for UE Category 1bis	Cell1				
6.2.4	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Non-Contention Based Random Access	Cell1				
6.2.4_2	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Non-Contention Based Random Access for UE Category 1bis	Cell1				
6.2.5	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth	Cell1				
6.2.6	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth	Cell1				
6.2.7	E-UTRAN FDD – Non-Contention Based Random Access Test For SCell in sTAG	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
6.2.8	E-UTRAN TDD – Non-Contention Based Random Access Test	Cell1	Cell2	Cell4		Intra-

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	For SCell in sTAG			Note1		band
		Cell1	Cell10	Cell30		Inter-band
6.2.10	E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1				
6.2.11	E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1				
6.2.12	RRC Connection Mobility Control / Random Access / E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1				
6.2.13	E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1				
6.2.14	E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1				
6.2.15	E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1				
6.3.1	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD	Cell3	Cell9			
6.3.1_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD for UE Category 1bis	Cell3	Cell9			
6.3.2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to UTRAN FDD	Cell6	Cell8			
6.3.2_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to UTRAN FDD for UE Category 1bis	Cell6	Cell8			
6.3.3	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is provided	Cell1	Cell26			
6.3.3_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is provided for UE Category 1bis	Cell1	Cell26			
6.3.4	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is provided	Cell1	Cell26			
6.3.4_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is provided for UE Category 1bis	Cell1	Cell26			
6.3.5	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD	Cell3	Cell9			
6.3.5_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD for UE Category 1bis	Cell3	Cell9			
6.3.6	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD	Cell6	Cell8			
6.3.6_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD for UE Category 1bis	Cell6	Cell8			
6.3.7	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Cell3	Cell9			
6.3.7_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis	Cell3	Cell9			
6.3.8	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Cell6	Cell8			
6.3.8_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis	Cell6	Cell8			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
6.3.9	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Cell3	Cell9			
6.3.9_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD without System Information for UE Category 1bis	Cell3	Cell9			
6.3.10	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Cell1	Cell26			
6.3.10_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is not provided for UE Category 1bis	Cell1	Cell26			
6.3.11	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Cell1	Cell26			
6.3.11_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is not provided for UE Category 1bis	Cell1	Cell26			
6.3.12	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Cell6	Cell8			
6.3.12_2	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided for UE Category 1bis	Cell6	Cell8			
7.1.1	E-UTRAN FDD-UE Transmit Timing Accuracy	Cell1				
7.1.1_2	E-UTRAN FDD - UE Transmit Timing Accuracy for UE category 1bis	Cell1				
7.1.2	E-UTRAN TDD-UE Transmit Timing Accuracy	Cell1				
7.1.2_2	E-UTRAN TDD - UE Transmit Timing Accuracy for UE category 1bis	Cell1				
7.1.3	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.3_1	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.4	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.4A	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.4_1	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.5	E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Cell1				
7.1.6	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.7	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.7A	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
7.1.7B	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.1.8	Void					
7.1.9	Void					
7.1.10	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1				
7.1.11	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1				
7.1.12	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1				
7.1.14	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1				
7.1.15	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1				
7.1.16	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1				
7.1.21	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Cell1				
7.1.22	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Cell1				
7.1.23	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Cell1				
7.1.24	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeB	Cell1				
7.2.1	E-UTRAN FDD-UE Timing Advance Adjustment Accuracy	Cell1				
7.2.1_2	E-UTRAN FDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Cell1				
7.2.2	E-UTRAN TDD-UE Timing Advance Adjustment Accuracy	Cell1				
7.2.2_2	E-UTRAN TDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Cell1				
7.2.3	E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	Cell1				
7.2.4	E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.2.5	E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.2.5A	E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.2.5B	E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
7.2.6	E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1				
7.2.7	E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1				
7.2.8	E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1				
7.2.10	E-UTRAN FDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1				
7.2.11	E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1				
7.2.12	E-UTRAN TDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1				
7.3.1	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	Cell1				
7.3.1_1	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Cell1				

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
7.3.2	E-UTRAN FDD Radio Link Monitoring Test for In-sync	Cell1				
7.3.2_1	E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Cell1				
7.3.3	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Cell1				
7.3.3_1	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Cell 1				
7.3.4	E-UTRAN TDD Radio Link Monitoring Test for In-sync	Cell1				
7.3.4_1	E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Cell1				
7.3.5	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1				
7.3.6	E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	Cell1				
7.3.7	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1				
7.3.8	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	Cell1				
7.3.9	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2			
7.3.10	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2			
7.3.11	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2			
7.3.12	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2			
7.3.13	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3			
7.3.14	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3			
7.3.15	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3			
7.3.16	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3			
7.3.17	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4		
7.3.18	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4		
7.3.19	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4		
7.3.20	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4		
7.3.21	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4		
7.3.22	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS	Cell1	Cell3	Cell4		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	assistance information and MBSFN ABS (feICIC) (Note 3)					
7.3.23	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	Cell1				
7.3.24	E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	Cell1				
7.3.25	E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	Cell1				
7.3.26	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1				
7.3.26_2	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	Cell1				
7.3.27	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1				
7.3.27_2	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 1bis	Cell1				
7.3.28	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1				
7.3.28_2	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	Cell1				
7.3.29	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Cell1				
7.3.29_2	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	Cell1				
7.3.30	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1				
7.3.31	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1				
7.3.32	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1				
7.3.33	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Cell1				
7.3.34	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1				
7.3.34_2	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	Cell1				
7.3.35	E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1				
7.3.35_2	E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE Category 1bis	Cell1				
7.3.36	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1				
7.3.36_2	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	Cell1				
7.3.37	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Cell1				
7.3.37_2	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	Cell1				
7.3.38	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Cell1	Cell10			
7.3.39	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	Cell1	Cell10			
7.3.40	E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Cell1	Cell10			
7.3.41	E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Cell1	Cell10			
7.3.42	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	Cell1	Cell10			
7.3.43	E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Cell1	Cell10			
7.3.44	E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD	Cell1	Cell10			
7.3.45	E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD	Cell1	Cell10			
7.3.46	E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in	Cell1	Cell10			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	DRX for PSCell in synchronous DC with PCell in FDD					
7.3.47	E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD	Cell1	Cell10			
7.3.48	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1				
7.3.49	E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1				
7.3.50	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1				
7.3.51	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1				
7.3.52	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1				
7.3.53	E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1				
7.3.54	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1				
7.3.55	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1				
7.3.56	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1				
7.3.57	E-UTRAN TDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1				
7.3.58	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1				
7.3.59	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1				
7.3.69	E-UTRAN HD-FDD Early Out-of-sync reporting Test for CE UE in CEMode A	Cell1				
7.4.1	E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC	Cell1	Cell10			
7.4.2	E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC	Cell1	Cell10			
7.5.1	E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	Cell 1				
7.5.4	E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	Cell 1				
7.6.1	E-UTRAN FDD-TDD CA interruption at SRS carrier based switching	Cell 1	Cell 10			
7.6.2	E-UTRAN TDD-TDD CA interruption at SRS carrier based switching	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.1.1	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell1	Cell2			
8.1.2	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2			
8.1.3	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2			
8.1.4	Void					
8.1.5	UE Measurement Procedures / E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell2			
8.1.6	UE Measurement Procedures / E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell1	Cell2			
8.1.7	UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Cell1	Cell2			
8.1.8	E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource	Cell1	Cell2	Cell6		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)					
8.1.9	E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth	Cell1	Cell2			
8.1.10	E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz bandwidth	Cell1	Cell2			
8.1.11	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	Cell1	Cell2			
8.1.11_2	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis	Cell1	Cell2			
8.1.12	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Cell1	Cell2			
8.1.12_2	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Cell1	Cell2			
8.1.13	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Cell1	Cell2			
8.1.13_2	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Cell1	Cell2			
8.1.17	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2			
8.1.17_2	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Cell1	Cell2			
8.1.18	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2			
8.1.18_2	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Cell1	Cell2			
8.1.23	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2			
8.1.24	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2			
8.1.25	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2			
8.1.26	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2			
8.1.27	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2			
8.1.28	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2			
8.1.29	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2			
8.1.30	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2			
8.1.31	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
8.1.32	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.33	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.34	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.35	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.36	E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.37	-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.38	E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.39	E-UTRAN HD-FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.1.40	E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells	Cell1	Cell2			
8.2.1	UE Measurement Procedures / E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2			
8.2.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2			
8.2.3	UE Measurement Procedures / E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell2			
8.2.4	UE Measurement Procedures / E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell1	Cell2			
8.2.5	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event-triggered Reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Cell1	Cell2			
8.2.6	E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
8.2.9	E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.2.10	E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CEModeB	Cell1	Cell2			
8.2.11	E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells	Cell1	Cell11			
8.3.1	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3			
8.3.1_2	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis	Cell6	Cell3			
8.3.2	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting when DRX is used under	Cell6	Cell3			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	fading propagation conditions in asynchronous cells					
8.3.2_2	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells for UE category 1bis	Cell6	Cell3			
8.3.3	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	Cell6	Cell3			
8.3.3_2	E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used for UE category 1bis	Cell6	Cell3			
8.3.4	UE Measurement Procedures / E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell6	Cell3			
8.3.5	UE Measurement Procedures / E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell6	Cell3			
8.3.6	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	Cell6	Cell3			
8.3.7	UE Measurement Procedures / E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group	Cell6	(Note 8)	(Note 8)	(Note 8)	
8.3.8	UE Measurement Procedures / FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 9)	(Note 10)	(Note 10)	
8.3.9	UE Measurement Procedures / FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	Cell6	(Note 9)	(Note 10)	(Note 10)	
8.3.12	E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	Cell6	Cell3			
8.3.13	E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	Cell6	Cell3			
8.3.14	E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Cell6	Cell3			
8.3.15	E-UTRAN HD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Cell6	Cell3			
8.3.16	E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Cell6	Cell3			
8.3.17	E-UTRAN HD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA in DRX	Cell6	Cell3			
8.3.18	E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB in DRX	Cell6	Cell3			
8.3.19	E-UTRAN HD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB in DRX	Cell6	Cell3			
8.4.1	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation	Cell6	Cell3			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	conditions in synchronous cells					
8.4.1_2	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Cell6	Cell3			
8.4.2	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Cell6	Cell3			
8.4.2_2	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells for UE category 1bis	Cell6	Cell3			
8.4.3	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Cell6	Cell3			
8.4.3_2	E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used for UE category 1bis	Cell6	Cell3			
8.4.4	UE Measurement Procedures / E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell6	Cell3			
8.4.5	UE Measurement Procedures / E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell6	Cell3			
8.4.6	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0	Cell6	Cell3			
8.4.6_2	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 for UE category 1bis	Cell6	Cell3			
8.4.7	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group	Cell6	(Note 8)	(Note 8)	(Note 8)	
8.4.8	UE Measurement Procedures / TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 9)	(Note 10)	(Note 10)	
8.4.9	TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	Cell6	(Note 9)	(Note 10)	(Note 10)	
8.4.12	E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA					
8.4.13	E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB					
8.4.14	E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA in DRX					
8.4.15	E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB in DRX					
8.5.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell3	Cell9			
8.5.2	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	Cell3	Cell9			
8.5.3	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Cell3	Cell9			
8.5.4	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	Cell3	Cell9			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
8.5.6	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	Cell3	Cell9			
8.5.7	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth	Cell3	Cell9			
8.5.8	E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 11)	(Note 12)	(Note 12)	
8.6.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell8			
8.6.3	E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 11)	(Note 12)	(Note 12)	
8.7.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell6	Cell8			
8.7.2	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	Cell6	Cell8			
8.7.3	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	Cell3	Cell9			
8.7.4	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Cell3	Cell9			
8.7.5	E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 11)	(Note 12)	(Note 13)	
8.7A.1	E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	Cell6	(Note 11)	(Note 12)	(Note 13)	
8.8.1	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting in AWGN	Cell6	Cell26			
8.8.2	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26			
8.9.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell6	Cell8			
8.9.2	UE Measurement Procedures / E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Cell6	Cell8			
8.10.1	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting in AWGN	Cell6	Cell26			
8.10.2	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26			
8.11.1	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN FDD - E-UTRAN FDD and E-UTRAN FDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6		
8.11.2	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6		
8.11.3	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA FDD to E-UTRA FDD and UTRA FDD cell search	Cell1	Cell6	Cell8		
8.11.4	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	Cell1	Cell6	Cell8		
8.11.5	UE Measurement Procedures / Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell6	Cell3	Cell24		
8.11.6	UE Measurement Procedures / Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell6	Cell3	Cell24		
8.14.1	UE Measurement Procedures / E-UTRAN TDD-FDD Inter-	Cell10	Cell1			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	frequency event triggered reporting under fading propagation conditions in asynchronous cells					
8.14.2	UE Measurement Procedures / E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Cell10	Cell1			
8.14.3	UE Measurement Procedures / E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell10	Cell1			
8.15.1	UE Measurement Procedures / E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell1	Cell10			
8.15.2	UE Measurement Procedures / E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Cell1	Cell10			
8.15.3	UE Measurement Procedures / E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell10			
8.16.1	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.2	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.3	UE Measurement Procedures / E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.4	UE Measurement Procedures / E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.5	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.6	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.7	UE Measurement Procedures / E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.8	UE Measurement Procedures / E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.9	E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.10	E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.11	E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
						band
8.16.12	E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.13	E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.14	E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.15	E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.16	E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.16.17	E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.17A	E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.18	E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.18A	E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.23	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	Cell1	Cell10	Cell30		
8.16.24	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Cell1	Cell10	Cell30		
8.16.25	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	Cell1	Cell10	Cell30		
8.16.26	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Cell1	Cell10	Cell30		
8.16.47	2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.48	2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Cell1	Cell2			Intra-band
		Cell1	Cell10			Inter-band
8.16.49	2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Cell1	Cell10			
8.16.50	2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Cell1	Cell10			
8.18.1	UE Measurement Procedures / E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions	Cell1	Cell15			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
8.19.1	UE Measurement Procedures / E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions	Cell1	Cell19			
8.20.1	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3 Note6	Cell13		Intra-band
		Cell6	Cell3	Cell10 Note4		Inter-band
8.20.2	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3 Note6	Cell13		Intra-band
		Cell6	Cell3	Cell10 Note4		Inter-band
8.20.2A	E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth	Cell6	Cell3 Note6	Cell13		Intra-band
		Cell6	Cell3	Cell10 Note4		Inter-band
8.20.3	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell8	Cell4		Intra-band
		Cell1	Cell8	Cell10		Inter-band
8.20.4	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions	Cell1	Cell8	Cell4		Intra-band
		Cell1	Cell8	Cell10		Inter-band
8.20.4A	E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Cell1	Cell8	Cell4		Intra-band
		Cell1	Cell8	Cell10		Inter-band
8.22.1	UE Measurement Procedures / E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Cell1	Cell2			
8.22.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Cell1	Cell2			
8.22.3	UE Measurement Procedures / E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Cell6	Cell3			
8.22.4	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Cell6	Cell3			
8.22.5	UE Measurement Procedures / E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell1	Cell2			
8.22.6	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell1	Cell2			
8.22.7	UE Measurement Procedures / E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell6	Cell3			
8.22.8	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	Cell6	Cell3			
8.22.9	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.22.10	UE Measurement Procedures / E-UTRAN TDD event triggered	Cell1	Cell2	Cell4		Intra-

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	reporting under deactivated SCell in non-DRX based on CRS based discovery signal			Note1		band
		Cell1	Cell10	Cell30		Inter-band
8.22.11	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.22.12	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
8.23.1	E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Cell1	Cell10			
8.23.2	E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Cell1	Cell10			
8.23.3	E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Cell1	Cell10			
8.23.4	E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Cell6	Cell3	Cell10 Note4		
8.23.5	E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Cell6	Cell3	Cell10 Note4		
8.23.6	E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Cell6	Cell3	Cell10 Note4		
8.23.7	E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Synchronous DC	Cell1	Cell10			
8.23.8	E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Asynchronous DC	Cell1	Cell10			
8.23.9	E-UTRAN TDD Addition and Release Delay of known PSCell in Synchronous DC	Cell1	Cell10			
8.25.1	E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN	Cell1	Cell2 (WLAN)			
8.25.2	E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN	Cell1	Cell2 (WLAN)			
8.26.1	E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell with FDD PCell in non-DRX	Cell1	Cell10			Inter-Band
8.26.2	E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell with TDD PCell in non-DRX	Cell1	Cell10			Inter-Band
8.26.3	E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX	Cell1	Cell10	Cell30		Inter-Band
8.26.4	E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX	Cell1	Cell10	Cell30		Inter-Band
8.26.5	E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal	Cell1	Cell10	Cell30		Inter-Band
8.26.6	E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in non-DRX for CRS based discovery signal	Cell1	Cell10	Cell30		Inter-Band
8.26.7	E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal	Cell1	Cell10	Cell30		Inter-Band
8.26.8	E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal	Cell1	Cell10	Cell30		Inter-Band
8.26.9	E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell10			
8.26.10	E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell10			
9.1.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Absolute	Cell1	Cell2			
9.1.1.1_1	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell1	Cell2			
9.1.1.1_2	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Absolute for UE Category 1bis	Cell1	Cell2			
9.1.1.2	Measurement Performance Requirements / E-UTRAN / FDD	Cell1	Cell2			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	Intra frequency RSRP Accuracy / Relative					
9.1.1.2_2	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Relative for UE Category 1bis	Cell1	Cell2			
9.1.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Absolute	Cell1	Cell2			
9.1.2.1_1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell1	Cell2			
9.1.2.1_2	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Absolute for UE Category 1bis	Cell1	Cell2			
9.1.2.2	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Relative	Cell1	Cell2			
9.1.2.2_2	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Relative for UE Category 1bis	Cell1	Cell2			
9.1.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute	Cell6	Cell3			
9.1.3.1_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell6	Cell3			
9.1.3.1_2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute for UE Category 1bis	Cell6	Cell3			
9.1.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative	Cell6	Cell3			
9.1.3.2_1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell6	Cell3			
9.1.3.2_2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative for UE Category 1bis	Cell6	Cell3			
9.1.4.1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Absolute	Cell6	Cell3			
9.1.4.1_1	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell6	Cell3			
9.1.4.1_2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Absolute for UE Category 1bis	Cell6	Cell3			
9.1.4.2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative	Cell6	Cell3			
9.1.4.2_1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell6	Cell3			
9.1.4.2_2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative for UE Category 1bis	Cell6	Cell3			
9.1.5.1	Measurement Performance Requirements / E-UTRAN / FDD – TDD Inter frequency RSRP Accuracy / Absolute	Cell1	Cell10			
9.1.5.1_1	Measurement Performance Requirements / E-UTRAN / FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell1	Cell10			
9.1.5.1_2	Measurement Performance Requirements / E-UTRAN / FDD – TDD Inter frequency RSRP Accuracy / Absolute for UE Category 1bis	Cell1	Cell10			
9.1.5.2	Measurement Performance Requirements / E-UTRAN / FDD- TDD Inter frequency RSRP Accuracy / Relative	Cell1	Cell10			
9.1.5.2_1	Measurement Performance Requirements / E-UTRAN / FDD- TDD Inter frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell1	Cell10			
9.1.5.2_2	Measurement Performance Requirements / E-UTRAN / FDD- TDD Inter frequency RSRP Accuracy / Relative for UE Category 1bis	Cell1	Cell10			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
9.1.6.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.6.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.6.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.6.2_1	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.7.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.7.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.7.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.7.2_1	Measurement Performance Requirements / TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.8.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.1.8.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Cell1	Cell2			
9.1.8.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.1.9.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.1.9.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Cell1	Cell2			
9.1.9.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.1.10.1	Measurement Performance Requirements / FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6			
9.1.10.1_1	Measurement Performance Requirements / FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell6			
9.1.10.2	Measurement Performance Requirements / FDD Relative	Cell1	Cell6			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)					
9.1.11.1	Measurement Performance Requirements / TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6			
9.1.11.1_1	Measurement Performance Requirements / TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell6			
9.1.11.2	Measurement Performance Requirements / TDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6			
9.1.12.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.12.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.12.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.13.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.13.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.13.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.14.1	FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.1.14.1_1	FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell2	Cell6		
9.1.14.2	FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.1.15.1	TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.1.15.1_1	TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.1.15.2	TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Cell1	Cell2	Cell6		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	(Note 3)					
9.1.16.1	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Cell1	Cell2			
9.1.16.1_1	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell2			
9.1.16.2	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Cell1	Cell2			
9.1.17.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute for 5 MHz	Cell1	Cell10			
9.1.17.1_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell10			
9.1.17.2	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Cell1	Cell10			
9.1.17.2_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell10			
9.1.18.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.18.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel 12 and forward)	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.18.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.19.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.19.1_1	TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel 12 and forward)	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.19.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.20.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.20.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.20.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
9.1.21.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.21.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.21.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.22	FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Cell1	Cell10	Cell30		
9.1.23	FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Cell1	Cell10	Cell30		
9.1.24.1_1	TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.25	Measurement Performance Requirements / FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell1	Cell2			
9.1.26	Measurement Performance Requirements / TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell1	Cell2			
9.1.27	Measurement Performance Requirements / FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell6	Cell3			
9.1.28	Measurement Performance Requirements / TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell6	Cell3			
9.1.29	FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell1	Cell2			
9.1.30	TDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell1	Cell2			
9.1.31	Measurement Performance Requirements / FDD-FDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell6	Cell3			
9.1.32	Measurement Performance Requirements / TDD-TDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell6	Cell3			
9.1.33	Measurement Performance Requirements / FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.34	Measurement Performance Requirements / TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.35	Measurement Performance Requirements / FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.36	Measurement Performance Requirements / TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.1.41.1	FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2			
9.1.41.2	FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
9.1.42.1	HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2			
9.1.42.2	HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2			
9.1.43.1	TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2			
9.1.43.2	TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2			
9.1.52	FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2			
9.1.53	HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2			
9.1.54	TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2			
9.1.55	FDD intra frequency absolute and relative RSRP accuracies for SCell with frame structure 3	Cell1	Cell10	Cell30		Inter-band
9.1.57	FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2			
9.1.58	HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2			
9.1.59	TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2			
9.1.60	FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with FDD PCell	Cell1	Cell10	Cell30		Inter-band
9.1.61	FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD PCell	Cell1	Cell10	Cell30		Inter-band
9.2.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute	Cell1	Cell2			
9.2.1.1_2	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute for UE Category 1bis	Cell1	Cell2			
9.2.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRQ Accuracy / Absolute	Cell1	Cell2			
9.2.2.1_2	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRQ Accuracy / Absolute for UE Category 1bis	Cell1	Cell2			
9.2.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Absolute	Cell6	Cell3			
9.2.3.1_2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Absolute for UE Category 1bis	Cell6	Cell3			
9.2.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Relative	Cell6	Cell3			
9.2.3.2_2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Relative for UE Category 1bis	Cell6	Cell3			
9.2.4.1	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Absolute	Cell6	Cell3			
9.2.4.1_2	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Absolute for UE Category 1bis	Cell6	Cell3			
9.2.4.2	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Relative	Cell6	Cell3			
9.2.4.2_2	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Relative for UE Category 1bis	Cell6	Cell3			
9.2.4A.1	Measurement Performance Requirements / FDD - TDD Inter Frequency Absolute RSRQ Accuracy	Cell1	Cell10			
9.2.4A.1_2	Measurement Performance Requirements / FDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Cell1	Cell10			
9.2.4A.2	Measurement Performance Requirements / FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Cell1	Cell10			
9.2.4A.2_2	Measurement Performance Requirements / FDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE Category 1bis	Cell1	Cell10			
9.2.5.1	Measurement Performance Requirements / FDD Absolute	Cell1	Cell2	Cell4		Intra-

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	RSRQ Accuracy for E-UTRA Carrier Aggregation			Note1		band
		Cell1	Cell10	Cell30		Inter-band
9.2.5.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.6.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.6.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.7.1	Measurement Performance Requirements / FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.2.8.1	Measurement Performance Requirements / TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2			
9.2.9.1	Measurement Performance Requirements / FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6			
9.2.10.1	Measurement Performance Requirements / TDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6			
9.2.11.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.11.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.12.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.12.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.15.1	FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.2.16.1	TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6		
9.2.17.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute for 5MHz	Cell1	Cell2			
9.2.18.1	Measurement Performance Requirements / FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Cell1	Cell10			
9.2.18.2	Measurement Performance Requirements / FDD - FDD Inter Frequency Relative Accuracy of RSRQ for 5MHz Bandwidth	Cell1	Cell10			
9.2.19.1	Measurement Performance Requirements / FDD-FDD Inter Frequency absolute WB-RSRQ accuracy	Cell6	Cell3			
9.2.20.1	Measurement Performance Requirements / TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	Cell6	Cell3			
9.2.21.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for	Cell1	Cell2	Cell4 Note1		Intra-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	10MHz+5MHz					
		Cell1	Cell10	Cell30		Inter-band
9.2.21.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.22.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.22.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.23.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.23.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.24.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.24.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.25.1	Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Cell1	Cell10			
9.2.25.2	Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Cell1	Cell10			
9.2.26.1	Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Cell1	Cell10			
9.2.26.2	Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Cell1	Cell10			
9.2.28	Measurement Performance Requirements / FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Cell1	Cell2			
9.2.29	Measurement Performance Requirements / TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Cell1	Cell2			
9.2.30	Measurement Performance Requirements / FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Cell6	Cell3			
9.2.31	Measurement Performance Requirements / TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Cell6	Cell3			
9.2.32	Measurement Performance Requirements / FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1		Intra-band
		Cell1	Cell10	Cell30		Inter-band
9.2.33	Measurement Performance Requirements / TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in	Cell1	Cell2	Cell4 Note1		Intra-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	CRS based discovery signal					
		Cell1	Cell10	Cell30		Inter-band
9.2.51	FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	Cell1	Cell10	Cell30		Inter-Band
9.2.52	TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	Cell1	Cell10	Cell30		Inter-Band
9.3.1	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	Cell3	Cell9			
9.3.2	Measurement Performance Requirements / E-UTRAN TDD- UTRA FDD CPICH RSCP absolute accuracy	Cell3	Cell9			
9.3.3	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Cell3	Cell9			
9.4.1	Measurement Performance Requirements / E- UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy	Cell3	Cell9			
9.4.2	Measurement Performance Requirements / E- UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy	Cell3	Cell9			
9.4.3	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Cell3	Cell9			
9.5.1	Measurement Performance Requirements / E- UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy	Cell3	Cell9			
9.5.2	Measurement Performance Requirements / E- UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy	Cell3	Cell9			
9.6.1	Measurement Performance Requirements / GSM RSSI accuracy for E-UTRAN FDD	Cell1	Cell26	Cell24		
9.6.2	Measurement Performance Requirements / GSM RSSI accuracy for E-UTRAN TDD	Cell1	Cell26	Cell24		
9.9.1.1	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Cell1				
9.9.1.1_1	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)	Cell1				
9.9.1.2	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Cell1				
9.9.2.1	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Cell1				
9.9.2.1_1	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)	Cell1				
9.9.2.2	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Cell1				
9.11.1	FS3 average RSSI accuracy case (PCell using FDD)	Cell1	Cell10			Inter-Band
9.11.2	FS3 average RSSI accuracy case (PCell using TDD)	Cell1	Cell10			Inter-Band
9.12.1	FS3 channel occupancy test (PCell using FDD)	Cell1	Cell10			Inter-Band
9.12.2	FS3 channel occupancy test (PCell using TDD)	Cell1	Cell10			Inter-Band
12.3.1	V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority	Cell1				
12.4	Congestion Control Measurement Test for V2X UE	Cell1				
12.5	Interruptions due to V2X Sidelink Communication	Cell1				

Note 1: Neighbour cell uses same frequency as SCC.
Note 2: “Intra-band” notation in the table refers to both intra-band contiguous and intra-band non-contiguous CA configuration as applicable.
Note 3: All cells are intra frequency and shall use the same range (mid) independently of the range information given in TS 36.508 Table 4.4.2-1.
Note 4: Low range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 5: The frequency range remains unchanged after any change of Cell IDs in the test procedure.
Note 6: Mid range shall be used for intra-band non-contiguous CA independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 7: For operating band 66 “High Range” simulated cells for all test cases shall be configured according to “High Range” as

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	CA Type (Note 2)
	defined in TS36.508 Table 4.3.1.1.66 when UL is not required on the cell. Otherwise “Paired High Range” shall be configured.					
Note 8:	3 Cells are randomly selected from (Cell 1, Cell 3, Cell 10, Cell 32, Cell 33, Cell 34, Cell 35, Cell 36)					
Note 9:	Cell is randomly selected from (Cell 33, Cell 34, Cell 35)					
Note 10:	2 Cells are randomly selected from (Cell 1, Cell 3, Cell 10, Cell 32, Cell 36)					
Note 11:	Cell is randomly selected from (Cell 5, Cell 8, Cell 9)					
Note 12:	2 Cells are randomly selected from (Cell 37, Cell 38, Cell 39)					
Note 13:	2 Cells are randomly selected from (Cell 7, Cell 37, Cell 38, Cell 39)					
Note 14:	Cell is randomly selected from (Cell 37, Cell 38, Cell 39)					
Note 15:	Cell in reduced performance group					
Note 16:	Cell is randomly selected from (Cell 7, Cell 37, Cell 38, Cell 39)					

Table E-2: Cell configuration mapping for 3DL CA RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5	
8.26.3A 8.16.83(generic duplex modes) 8.16.84(generic duplex modes)	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XA-YA-ZA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Z	Cell3	Z	Cell4		
	Default Test Settings for a CA_XA-XA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XA-YA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XD / CA_XA-XC / CA_XC-XA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	X	Cell3	X	Cell4		
9.1.68(generic duplex modes) Note 5	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a XA-YA-ZA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Z	Cell4	Z	Cell6
	Default Test Settings for a XA-XA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a XA-YA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	

	Band		Band		Band		Band		Band		
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6	
	Default Test Settings for a CA_XD/CA_XA-XC/CA_XC-XA Configuration										
	PCC		SCC1		Neigh		SCC2		Neigh		
	Band		Band		Band		Band		Band		
	X	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6	
	Default Test Settings for a CA_XA-YC Configuration										
8.16.85(generic duplex modes) Note 3	PCC		SCC1		SCC2						
8.16.86(generic duplex modes) Note 3	Band		Band		Band						
9.2.55(generic duplex modes) Note 5	X	Cell1	Y	Cell2	Y	Cell3					
	Default Test Settings for a CA_XC-YA Configuration										
	PCC		SCC1		SCC2						
	Band		Band		Band						
	X	Cell1	X	Cell2	Y	Cell3					
	Default Test Settings for a CA_XA-YA-ZA Configuration										
	PCC		SCC1		SCC2						
	Band		Band		Band						
	X	Cell1	Y	Cell2	Z	Cell3					
	Default Test Settings for a CA_XA-XA-YA Configuration										
	PCC		SCC1		SCC2						
	Band		Band		Band						
6.2.9	X	Cell1	X	Cell2	Y	Cell3					
7.1.13	Default Test Settings for a CA_XA-YA-YA Configuration										
	PCC		SCC1		SCC2						
	Band		Band		Band						
	X	Cell1	Y	Cell2	Y	Cell3					
	Default Test Settings for a CA_XD / CA_XA-XC / CA_XC-XA Configuration										
	PCC		SCC1		SCC2						
	Band		Band		Band						
	X	Cell1	X	Cell2	X	Cell3					

Note1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7].

Note2: X, Y and Z correspond to the different bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_1A-3A-19A, X=1, Y=3, Z=19. For PCell in FDD CA Configuration, FDD bands shall precede TDD bands. E.g. for CA_13A-48A-66A, X=13, Y=66, Z=48. For PCell in TDD CA Configuration, TDD bands shall precede FDD bands. E.g. for CA_13A-48A-66A, X=48, Y=13, Z=66.

Note3: For intra band contiguous CA, CC addition shall be done in increasing frequency order to ensure Contiguous CC addition.

Note 4: For simplicity, this table does not consider CA Type B. For CA Type B, the corresponding Type C default test settings shall be used. For example, for CA_XB_YA, the entry for CA_XC_YA shall be used.

Note 5: These test cases require to swap the bands so that every band in the CA Configuration is used as PCC. In the most generic case XA-YA-ZA, the test case shall be run three times: CA_XA-YA-ZA, CA_YA-XA-ZA and CA_ZA-XA-YA.

Table E-3: Cell configuration mapping for 2DL CA 20MHz+10MHz RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3	
8.16.21 **8.16.22**	Default Test Settings for a CA_XA-YA Configuration					
	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	Y	Cell10	Y	Cell30
	Y	Cell1	X	Cell10	X	Cell30
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
8.20.2B	Default Test Settings for a CA_XA-YA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	Y	Cell3	Y	Cell10 Note5
	Y	Cell6	X	Cell3	X	Cell10 Note5
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	X	Cell3	X	Cell13
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	X	Cell3 Note6	X	Cell13
8.20.4B	Default Test Settings for a CA_XA-YA Configuration					
	PCC		Neigh (UTRA)		SCC1	
	Band		Band		Band	
	X	Cell1	Y	Cell8	Y	Cell10
	Y	Cell1	X	Cell8	X	Cell10
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell8	X	Cell4
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell8	X	Cell4
	Default Test Settings for a CA_XA-YA Configuration					
	PCC		SCC1		Neigh	

	Band		Band		Band	
9.1.24.1	X	Cell1	Y	Cell10	Y	Cell30
9.1.24.2	Y	Cell1	X	Cell10	X	Cell30
9.2.27.1	Default Test Settings for a CA_XC Configuration					
9.2.27.2	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1

Note 1: Neighbour cell uses same frequency as SCC.
Note 2: X, Y correspond to the different bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_1A-3A, X=1, Y=3.
Note 3: For intra-band contiguous and intra-band non-contiguous CA, 20 MHz for PCC, 10MHz for SCC are tested.
Note 4: For inter-band CA configuration, 20 MHz for band X and 10 MHz for band Y are tested if X supports 20 MHz and Y supports 10 MHz. Otherwise, 10 MHz for band X and 20 MHz for band Y are tested.
Note 5: Low range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 6: Mid range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 7: For simplicity, this table does not consider CA Type B. For CA Type B, the corresponding Type C default test settings shall be used. For example, for CA_XB, the entry for CA_XC shall be used.

Table E-4: Ncell and Cell configuration mapping for RRM testing of Category NB1

Test Case	Description	36.521-3 Ncell1	36.521-3 Ncell2	36.521-3 Cell1	36.521-3 Cell2
4.2.18	HD – FDD Intra frequency case for UE category NB1 In-Band mode in normal coverage	Ncell18	Ncell5	Cell1	Cell11
4.2.19	HD – FDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	Ncell18	Ncell5	Cell1	Cell11
4.2.24	HD – FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	Ncell18	Ncell6a	Cell1	
4.2.35	E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage	Ncell18	Ncell5	Cell1	Cell11
4.2.36	E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	Ncell18	Ncell5	Cell1	Cell11
4.2.37	E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	Ncell18	Ncell6a	Cell1	
4.2.38	HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage with serving cell RRM measurement relaxation	Ncell18	Ncell5	Cell1	Cell11
6.1.15	HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	Ncell1	Ncell2	Cell1	Cell2
6.1.16	HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 under enhanced coverage	Ncell18	Ncell1	Cell1	
6.1.23	E-UTRAN TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage	Ncell18	Ncell1	Cell1	
6.1.24	E-UTRAN TDD - TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage	Ncell18	Ncell1	Cell1	Cell2
6.2.16	Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage	Ncell18		Cell1	

Test Case	Description	36.521-3 Ncell1	36.521-3 Ncell2	36.521-3 Cell1	36.521-3 Cell2
6.2.17	Contention Based Random Access Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Ncell18	Ncell1	Cell1	
6.2.18	Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Ncell18		Cell1	
6.2.19	TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage	Ncell18		Cell1	
6.2.20	TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in enhanced coverage	Ncell18	Ncell1	Cell1	
6.2.21	TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Ncell18		Cell1	
7.1.17	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Ncell18		Cell1	
7.1.18	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	Ncell18		Cell1	
7.1.27	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Ncell18		Cell1	
7.1.28	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	Ncell18		Cell1	
7.2.9	HD-FDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhance Coverage	Ncell1			
7.2.15	E-UTRAN TDD – TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage	Ncell1			
7.3.60	HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Ncell18		Cell1	
7.3.61	HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in Enhanced Coverage	Ncell18		Cell1	
7.3.62	HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Enhanced Coverage	Ncell18		Cell1	
7.3.63	HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Normal Coverage	Ncell18		Cell1	
7.3.64	HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage	Ncell18		Cell1	
7.3.65	HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage	Ncell18		Cell1	
7.3.66	HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 Standalone mode in Normal Coverage	Ncell18		Cell1	
7.3.67	HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 guard band mode in Enhanced Coverage	Ncell18		Cell1	
7.3.88	TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Ncell18		Cell1	
7.3.89	TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	Ncell18		Cell1	

Table E-5: Cell configuration mapping for 4DL CA RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7	
8.16.87 (generic duplex modes) 8.16.88 (generic duplex modes)	Default Test Settings for a CA_XA-YA-ZA-RA													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	Y	2	Z	3	R	4	R	6				
	Default Test Settings for a CA_XA-YD													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	Y	2	Y	3	Y	4	Y	6				
	Default Test Settings for a CA_XD-YA													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	X	2	X	3	Y	4	Y	6				
	Default Test Settings for a CA_XC-YC													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	X	2	Y	3	Y	4	Y	6				
	Default Test Settings for a CA_XA-YA-ZC													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	Y	2	Z	3	Z	4	Z	6				
	Default Test Settings for a CA_XA-YC-ZA													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	Y	2	Y	3	Z	4	Z	6				
	Default Test Settings for a CA_XC-YA-ZA													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	X	2	Y	3	Z	4	Z	6				
	Default Test Settings for a CA_XE													
	PCC		SCC1		SCC2		SCC3		Neigh					
	Band		Band		Band		Band		Band					
	X	1	X	2	X	3	X	4	X	6				
9.1.69(generic duplex modes)	Default Test Settings for a CA_XA-YA-ZA-RA													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	6	R	10	R	11
	Default Test Settings for a CA_XA-YD													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	6	Y	10	Y	11
	Default Test Settings for a CA_XD-YA													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	6	Y	10	Y	11
	Default Test Settings for a CA_XC-YC													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	Y	4	Y	6	Y	10	Y	11
	Default Test Settings for a CA_XA-YA-ZC													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	6	Z	10	Z	11
	Default Test Settings for a CA_XA-YC-ZA													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	6	Z	10	Z	11
	Default Test Settings for a CA_XC-YA-ZA													
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	Y	4	Y	6	Z	10	Z	11
	Default Test Settings for a CA_XE													

	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh	
	Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	6	X	10	X	11
8.16.89(generic duplex modes) Note 5 8.16.90(generic duplex modes) Note 5	Default Test Settings for a CA_XA-YA-ZA-RA													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	Y	2	Z	3	R	4						
	Default Test Settings for a CA_XA-YD													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	Y	2	Y	3	Y	4						
	Default Test Settings for a CA_XD-YA													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	X	2	X	3	Y	4						
	Default Test Settings for a CA_XC-YC													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	X	2	Y	3	Y	4						
	Default Test Settings for a CA_XA-YA-ZC													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	Y	2	Z	3	Z	4						
	Default Test Settings for a CA_XA-YC-ZA													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	Y	2	Y	3	Z	4						
	Default Test Settings for a CA_XC-YA-ZA													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	X	2	Z	3	Z	4						
	Default Test Settings for a CA_XE													
	PCC		SCC1		SCC2		SCC3							
	Band		Band		Band		Band							
	X	1	X	2	X	3	X	4						

Note 1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7].

Note 2: X, Y, Z and R correspond to the bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_2A-2A-4A-5A, X=2, Y=2, Z=4, R=5. For PCell in FDD CA Configuration, FDD bands shall precede TDD bands. E.g. for CA_2A-2A-42A-66A, X=2, Y=2, Z=66, R=42. For PCell in TDD CA Configuration, TDD bands shall precede FDD bands. E.g. for CA_2A-2A-42A-66A, X=42, Y=2, Z=2, R=66.

Note 3: These test cases require to swap the bands so that every band in the CA Configuration is used as PCC. In the most generic case XA-YA-ZA-RA, the test case shall be run four times: CA_XA-YA-ZA-RA, CA_YA-ZA-RA-XA, CA_ZA-RA- XA-YA and CA_RA- XA-YA-ZA.

Note 4: For simplicity, this table does not consider CA Type B. For CA Type B, the corresponding Type C default test settings shall be used. For example, for CA_XB-YA-ZA, the entry for CA_XC-YA-ZA shall be used.

Note 5: For intra band contiguous CA, CC addition shall be done in increasing frequency order to ensure Contiguous CC addition.

Table E-6: Cell configuration mapping for 5DL CA RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9	
8.16.91 (generic duplex modes) 8.16.92 (generic duplex modes)	**Default Test Settings for a CA_XA-YA-ZA-RA-SA**																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Z	3	R	4	S	6	S	11						
	Default Test Settings for a CA_XA-YE																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Y	3	Y	4	Y	6	Y	11						
	Default Test Settings for a CA_XE-YA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	X	3	X	4	Y	6	Y	11						
	Default Test Settings for a CA_XC-YD																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	Y	3	Y	4	Y	6	Y	11						
	Default Test Settings for a CA_XD-YC																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	X	3	Y	4	Y	6	Y	11						
	Default Test Settings for a CA_XA-YA-ZD																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Z	3	Z	4	Z	6	Z	11						
	Default Test Settings for a CA_XA-YD-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Y	3	Y	4	Z	6	Z	11						
	Default Test Settings for a CA_XD-YA-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	X	3	Y	4	Z	6	Z	11						
	Default Test Settings for a CA_XA-YC-ZC																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Y	3	Z	4	Z	6	Z	11						
	Default Test Settings for a CA_XC-YA-ZC																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	Y	3	Z	4	Z	6	Z	11						

	Default Test Settings for a CA_XC-YC-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	Y	3	Y	4	Z	6	Z	11						
	Default Test Settings for a CA_XA-YA-ZA-RC																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Z	3	R	4	R	6	R	11						
	Default Test Settings for a CA_XA-YA-ZC-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Z	3	Z	4	R	6	R	11						
	Default Test Settings for a CA_XA-YC-ZA-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	Y	2	Y	3	Z	4	R	6	R	11						
	Default Test Settings for a CA_XC-YA-ZA-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	Y	3	Z	4	R	6	R	11						
	Default Test Settings for a CA_XF																	
	PCC		SCC1		SCC2		SCC3		SCC4		Neigh							
	Band		Band		Band		Band		Band		Band							
	X	1	X	2	X	3	X	4	X	6	X	11						
8.16.93(generic duplex modes) Note 5 8.16.94(generic duplex modes) Note 5 9.2.57(generic duplex modes)	**Default Test Settings for a CA_XA-YA-ZA-RA-SA**																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	R	4	S	6								
	Default Test Settings for a CA_XA-YE																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Y	6								
	Default Test Settings for a CA_XE-YA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	X	3	X	4	Y	6								
	Default Test Settings for a CA_XC-YD																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Y	4	Y	6								
	Default Test Settings for a CA_XD-YC																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	X	3	Y	4	Y	6								

	Default Test Settings for a CA_XA-YA-ZD																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	Z	4	Z	6								
	Default Test Settings for a CA_XA-YD-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Z	6								
	Default Test Settings for a CA_XD-YA-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	X	3	Y	4	Z	6								
	Default Test Settings for a CA_XA-YC-ZC																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Z	4	Z	6								
	Default Test Settings for a CA_XC-YA-ZC																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Z	4	Z	6								
	Default Test Settings for a CA_XC-YC-ZA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Y	4	Z	6								
	Default Test Settings for a CA_XA-YA-ZA-RC																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	R	4	R	6								
	Default Test Settings for a CA_XA-YA-ZC-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	Z	4	R	6								
	Default Test Settings for a CA_XA-YC-ZA-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Z	4	R	6								
	Default Test Settings for a CA_XC-YA-ZA-RA																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Z	4	R	6								
	Default Test Settings for a CA_XF																	
	PCC		SCC1		SCC2		SCC3		SCC4									
	Band		Band		Band		Band		Band									
	X	1	X	2	X	3	X	4	X	6								

9.1.70(generic duplex modes)

Default Test Settings for a CA_XA-YA-ZA-RA-SA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	6	R	10	R	11	S	12	S	14

Default Test Settings for a CA_XA-YE

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	6	Y	10	Y	11	Y	12	Y	14

Default Test Settings for a CA_XE-YA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	X	4	X	6	X	10	X	11	Y	12	Y	14

Default Test Settings for a CA_XC-YD

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	Y	4	Y	6	Y	10	Y	11	Y	12	Y	14

Default Test Settings for a CA_XD-YC

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	X	4	X	6	Y	10	Y	11	Y	12	Y	14

Default Test Settings for a CA_XA-YA-ZD

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	6	Z	10	Z	11	Z	12	Z	14

Default Test Settings for a CA_XA-YD-ZA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	6	Y	10	Y	11	Z	12	Z	14

Default Test Settings for a CA_XD-YA-ZA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	X	4	X	6	Y	10	Y	11	Z	12	Z	14

Default Test Settings for a CA_XA-YC-ZC

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	6	Z	10	Z	11	Z	12	Z	14

Default Test Settings for a CA_XC-YA-ZC

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	Y	4	Y	6	Z	10	Z	11	Z	12	Z	14

Default Test Settings for a CA_XC-YC-ZA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	Y	4	Y	6	Y	10	Y	11	Z	12	Z	14

	Default Test Settings for a CA_XA-YA-ZA-RC																
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	6	R	10	R	11	R	12	R	14
	Default Test Settings for a CA_XA-YA-ZC-RA																
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	6	Z	10	Z	11	R	12	R	14
	Default Test Settings for a CA_XA-YC-ZA-RA																
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	6	Z	10	Z	11	R	12	R	14
	Default Test Settings for a CA_XC-YA-ZA-RA																
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	Y	4	Y	6	Z	10	Z	11	R	12	R	14
	Default Test Settings for a CA_XF																
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	6	X	10	X	11	X	12	X	14

Note 1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7].
Note 2: X, Y, Z, R and S correspond to the bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_2A-2A-4A-4A-5A, X=2, Y=2, Z=4, R=4, S=5. For PCell in FDD CA Configuration, FDD bands shall precede TDD bands. E.g. for CA_2A-2A-41A-42A-66A, X=2, Y=2, Z=66, R=41, S=42. For PCell in TDD CA Configuration, TDD bands shall precede FDD bands. E.g. for CA_2A-2A-41A-42A-66A, X=41, Y=42, Z=2, R=2, S=66.
Note 3: These test cases require to swap the bands so that every band in the CA Configuration is used as PCC. In the most generic case CA_XA-YA-ZA-RA-SA, the test case shall be run five times: CA_XA-YA-ZA-RA-SA, CA_YA-ZA-RA-SA-XA, CA_ZA-RA-SA-XA-YA, CA_RA-SA-XA-YA-ZA and CA_SA-XA-YA-ZA-RA.
Note 4: For simplicity, this table does not consider CA Type B. For CA Type B, the corresponding Type C default test settings shall be used. For example, for CA_XB-YA-ZA-RA, the entry for CA_XC-YA-ZA-RA shall be used.
Note 5: For intra-band contiguous CA, CC addition shall be done in increasing frequency order to ensure Contiguous CC addition.

Table E-7: Cell configuration mapping for 6DL CA RRM testing

Test Case	**36.521-3 Cell1**		**36.521-3 Cell2**		**36.521-3 Cell3**		**36.521-3 Cell4**		**36.521-3 Cell5**		**36.521-3 Cell6**		**36.521-3 Cell7**		**36.521-3 Cell8**		**36.521-3 Cell9**		**36.521-3 Cell10**		**36.521-3 Cell11**	
8.16.95 8.16.96	**Default Test Settings for a CA_XA-YA-ZA-RA-SA-TA**																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	R	4	S	1a	T	6	T	11								
	Default Test Settings for a CA_XA-YF																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	11								
	Default Test Settings for a CA_XA-YA-ZE																					

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11	
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	Z	4	Z	1a	Z	6	Z	11								
	Default Test Settings for a CA_XA-YE-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Y	1a	Z	6	Z	11								
	Default Test Settings for a CA_XE-YA-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	X	2	X	3	X	4	Y	1a	Z	6	Z	11								
	Default Test Settings for a CA_XC-YE																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Y	4	Y	1a	Y	6	Y	11								
	Default Test Settings for a CA_XE-YC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	X	2	X	3	X	4	Y	1a	Y	6	Y	11								
	Default Test Settings for a CA_XA-YA-ZA-RD																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	R	4	R	1a	R	6	R	11								
	Default Test Settings for a CA_XA-YA-ZD-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	Z	4	Z	1a	R	6	R	11								
	Default Test Settings for a CA_XA-YD-ZA-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Z	1a	R	6	R	11								
	Default Test Settings for a CA_XA-YC-ZD																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	11								
	Default Test Settings for a CA_XA-YD-ZC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Y	4	Z	1a	Z	6	Z	11								
	Default Test Settings for a CA_XC-YD-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11	
	X	1	X	2	Y	3	Y	4	Y	1a	Z	6	Z	11								
	Default Test Settings for a CA_XD-YC-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	X	2	X	3	Y	4	Y	1a	Z	6	Z	11								
	Default Test Settings for a CA_XC-YC-ZC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	X	2	Y	3	Y	4	Z	1a	Z	6	Z	11								
	Default Test Settings for a CA_XA-YA-ZC-RC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	Z	4	R	1a	R	6	R	11								
	Default Test Settings for a CA_XA-YC-ZC-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Y	3	Z	4	Z	1a	R	6	R	11								
	Default Test Settings for a CA_XA-YA-ZA-RC-SA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		Neigh									
	Band		Band		Band		Band		Band		Band		Band									
	X	1	Y	2	Z	3	R	4	R	1a	S	6	S	11								
8.16.97	**Default Test Settings for a CA_XA-YA-ZA-RA-SA-TA**																					
8.16.98	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
9.2.58	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	R	4	S	1a	T	6										
	Default Test Settings for a CA_XA-YF																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Y	4	Y	1a	Y	6										
	Default Test Settings for a CA_XA-YA-ZE																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	Z	4	Z	1a	Z	6										
	Default Test Settings for a CA_XA-YE-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Y	4	Y	1a	Z	6										
	Default Test Settings for a CA_XE-YA-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	X	3	X	4	Y	1a	Z	6										
	Default Test Settings for a CA_XC-YE																					

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11	
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	Y	3	Y	4	Y	1a	Y	6										
	Default Test Settings for a CA_XE-YC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	X	3	X	4	Y	1a	Y	6										
	Default Test Settings for a CA_XA-YA-ZA-RD																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	R	4	R	1a	R	6										
	Default Test Settings for a CA_XA-YA-ZD-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	Z	4	Z	1a	R	6										
	Default Test Settings for a CA_XA-YD-ZA-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Y	4	Z	1a	R	6										
	Default Test Settings for a CA_XA-YC-ZD																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6										
	Default Test Settings for a CA_XA-YD-ZC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Y	4	Z	1a	Z	6										
	Default Test Settings for a CA_XC-YD-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	Y	3	Y	4	Y	1a	Z	6										
	Default Test Settings for a CA_XD-YC-ZA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	X	3	Y	4	Y	1a	Z	6										
	Default Test Settings for a CA_XC-YC-ZC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	X	2	Y	3	Y	4	Z	1a	Z	6										
	Default Test Settings for a CA_XA-YA-ZC-RC																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11	
	X	1	Y	2	Z	3	Z	4	R	1a	R	6										
	Default Test Settings for a CA_XA-YC-ZC-RA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Z	4	Z	1a	R	6										
	Default Test Settings for a CA_XA-YA-ZA-RC-SA																					
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5											
	Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	R	4	R	1a	S	6										
9.1.71	**Default Test Settings for a CA_XA-YA-ZA-RA-SA-TA**																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	R	6	R	10	S	11	S	12	T	14	T	23
	Default Test Settings for a CA_XA-YF																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Y	11	Y	12	Y	14	Y	23
	Default Test Settings for a CA_XA-YA-ZE																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	Z	11	Z	12	Z	14	Z	23
	Default Test Settings for a CA_XA-YE-ZA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1	Y	6	Y	10	Y	11	Y	12	Z	14	Z	23
	Default Test Settings for a CA_XE-YA-ZA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	1a	X	6	X	10	Y	11	Y	12	Z	14	Z	23
	Default Test Settings for a CA_XC-YE																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	1a	Y	6	Y	10	Y	11	Y	12	Y	14	Y	23
	Default Test Settings for a CA_XE-YC																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	1a	X	6	X	10	Y	11	Y	12	Y	14	Y	23
	Default Test Settings for a CA_XA-YA-ZA-RD																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	R	6	R	10	R	11	R	12	R	14	R	23
	Default Test Settings for a CA_XA-YA-ZD-RA																					

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11	
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	Z	11	Z	12	R	14	R	23
	Default Test Settings for a CA_XA-YD-ZA-RA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Z	11	Z	12	R	14	R	23
	Default Test Settings for a CA_XA-YC-ZD																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1a	Z	6	Z	10	Z	11	Z	12	Z	14	Z	23
	Default Test Settings for a CA_XA-YD-ZC																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Z	11	Z	12	Z	14	Z	23
	Default Test Settings for a CA_XC-YD-ZA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	Y	4	Y	1a	Y	6	Y	10	Y	11	Y	12	Z	14	Z	23
	Default Test Settings for a CA_XD-YC-ZA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	X	4	X	1a	Y	6	Y	10	Y	11	Y	12	Z	14	Z	23
	Default Test Settings for a CA_XC-YC-ZC																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	X	2	X	3	Y	4	Y	1a	Y	6	Y	10	Z	11	Z	12	Z	14	Z	23
	Default Test Settings for a CA_XA-YA-ZC-RC																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	R	11	R	12	R	14	R	23
	Default Test Settings for a CA_XA-YC-ZC-RA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Y	4	Y	1a	Z	6	Z	10	Z	11	Z	12	R	14	R	23
	Default Test Settings for a CA_XA-YA-ZA-RC-SA																					
	PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh	
	Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
	X	1	Y	2	Y	3	Z	4	Z	1a	R	6	R	10	R	11	R	12	S	14	S	23

Test Case	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	36.521-3 Cell4	36.521-3 Cell5	36.521-3 Cell6	36.521-3 Cell7	36.521-3 Cell8	36.521-3 Cell9	36.521-3 Cell10	36.521-3 Cell11

Note 1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7].
Note 2: X, Y, Z, R, S and T correspond to the bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_1A-3A-3A-7A-7A-8A, X=1, Y=3, Z=3, R=7, S=7, T=8. For PCell in FDD CA Configuration, FDD bands shall precede TDD bands. E.g. for CA_2A-2A-41A-42A-66A-66A, X=2, Y=2, Z=66, R=66, S=41, T=42. For PCell in TDD CA Configuration, TDD bands shall precede FDD bands. E.g. for CA_2A-2A-41A-42A-66A-66A, X=41, Y=42, Z=2, R=2, S=66, T=66.
Note 3: For simplicity, this table does not consider CA Type B. For CA Type B, the corresponding Type C default test settings shall be used. For example, for CA_XB-YE, the entry for CA_XC-YE shall be used.
Note 4: For intra-band contiguous CA, CC addition shall be done in increasing frequency order to ensure Contiguous CC addition.

Table E-8: Cell configuration mapping for 7DL CA RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5		36.521-3 Cell6		36.521-3 Cell7		36.521-3 Cell8		36.521-3 Cell9		36.521-3 Cell10		36.521-3 Cell11		36.521-3 Cell12		36.521-3 Cell13	
8.16.99 8.16.100	**Default Test Settings for a CA_XA-YA-ZA-RA-SA-TA-UA**																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	R	4	S	1a	T	6	T	11	U	14										
	Default Test Settings for a CA_XA-YA-ZF																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	Z	4	Z	1a	Z	6	Z	11	Z	14										
	Default Test Settings for a CA_XA-YC-ZE																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	11	Z	14										
	Default Test Settings for a CA_XA-YE-ZC																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Y	3	Y	4	Y	1a	Z	6	Z	11	Z	14										
	Default Test Settings for a CA_XC-YE-ZA																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	X	2	Y	3	Y	4	Y	1a	Y	6	Z	11	Z	14										
	Default Test Settings for a CA_XE-YA-ZC																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	X	2	X	3	X	4	Y	1a	Z	6	Z	11	Z	14										
	Default Test Settings for a CA_XA-YA-ZA-RE																									
	PCC		SCC1		SCC2		SCC3		SCC4		SCC5		SCC6		Neigh											
	Band		Band		Band		Band		Band		Band		Band		Band											
	X	1	Y	2	Z	3	R	4	R	1a	R	6	R	11	R	14										

| | | |

| | | |

Default Test Settings for a CA_XA-YE-ZC

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Y	11	Y	12	Z	13	Z	14	Z	23	Z	30

Default Test Settings for a CA_XC-YE-ZA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	Y	4	Y	1a	Y	6	Y	10	Y	11	Y	12	Y	13	Y	14	Z	23	Z	30

Default Test Settings for a CA_XE-YA-ZC

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	X	2	X	3	X	4	X	1a	X	6	X	10	Y	11	Y	12	Z	13	Z	14	Z	23	Z	30

Default Test Settings for a CA_XA-YA-ZA-RE

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	1a	R	6	R	10	R	11	R	12	R	13	R	14	R	23	R	30

Default Test Settings for a CA_XA-YA-ZE-RA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	Z	11	Z	12	Z	13	Z	14	R	23	R	30

Default Test Settings for a CA_XA-YC-ZD-RA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	1a	Z	6	Z	10	Z	11	Z	12	Z	13	Z	14	R	23	R	30

Default Test Settings for a CA_XA-YD-ZC-RA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Z	11	Z	12	Z	13	Z	14	R	23	R	30

Default Test Settings for a CA_XA-YE-ZA-RA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Y	4	Y	1a	Y	6	Y	10	Y	11	Y	12	Z	13	Z	14	R	23	R	30

Default Test Settings for a CA_XA-YA-ZC-RC-SA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	R	11	R	12	R	13	R	14	S	23	S	30

Default Test Settings for a CA_XA-YA-ZD-RA-SA

PCC		SCC1		Neigh		SCC2		Neigh		SCC3		Neigh		SCC4		Neigh		SCC5		Neigh		SCC6		Neigh	
Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band		Band	
X	1	Y	2	Y	3	Z	4	Z	1a	Z	6	Z	10	Z	11	Z	12	R	13	R	14	S	23	S	30

Note 1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7].
Note 2: X, Y, Z, R, S, T and U correspond to the bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1 [10]. E.g. for CA_1A-1A-3C-7C-28, X=1, Y=1, Z=3, R=3, S=7, T=7, U=28. For PCell in FDD CA Configuration, FDD bands shall precede TDD bands. E.g. for CA_25A-25A-41F, X=25, Y=25, Z=41, R=41, S=41, T=41, U=41. For PCell in TDD CA Configuration, TDD bands shall precede FDD bands. E.g. for CA_25A-25A-41F, X=41, Y=41, Z=41, R=41, S=41, T=25, U=25.
Note 3: For intra-band contiguous CA, CC addition shall be done in increasing frequency order to ensure Contiguous CC addition.

Annex F (normative): Measurement uncertainties and Test Tolerances

The requirements of this clause apply to all applicable tests in the present document.

F.1 Acceptable uncertainty of Test System (normative)

See TS 36.521-1 [10] Annex F1.

F.1.1 Measurement of test environments

See TS 36.521-1 [10] Annex F1.1.

F.1.2 Measurement of RRM requirements

Table F.1.2-1: Maximum Test System Uncertainty for RRM Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
4.2.1 E-UTRA FDD - FDD cell re-selection intra frequency	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
4.2.2 E-UTRA TDD - TDD cell re-selection intra frequency	Same as 4.2.1	
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
4.2.4 E-UTRA FDD - TDD cell re-selection inter frequency	Same as 4.2.3	
4.2.5 E-UTRA TDD - FDD cell re-selection inter frequency	Same as 4.2.3	
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	
4.2.7 E-UTRA FDD Inter frequency re-selection in the existence of non-allowed CSG cell	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_3 / N_{oc1}$ is the ratio of cell 3 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
4.2.8 E-UTRA TDD Inter frequency re-selection in the existence of non-allowed CSG cell	Same as 4.2.7	
4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth	Same as 4.2.1	
4.2.10 E-UTRAN FDD – FDD reselection using an increased number of carriers	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc4}$ ±0.3 dB averaged over BW_{Config}	N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN
4.2.11 E-UTRAN TDD – TDD reselection using an increased number of carriers	Same as 4.2.10	Same as 4.2.10

4.2.12 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.13 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.14 E-UTRA TDD - TDD intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.15 E-UTRAN FDD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	
4.2.16 E-UTRAN HD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	
4.2.17 E-UTRAN TDD - TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	
4.2.18 HD-FDD Intra frequency cell reselection for Category NB1 UE in In-Band Mode under Normal Coverage	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_2 / N_{oc1}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of eCell 1 signal / AWGN $\hat{E}sn_1 / N_{oc1}$ is the ratio of nCell1 signal / AWGN $\hat{E}sn_2 / N_{oc1}$ is the ratio of nCell2 signal / AWGN
4.2.19 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_2 / N_{oc1}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of Cell 1 signal / AWGN $\hat{E}s_2 / N_{oc1}$ is the ratio of Cell 2 signal / AWGN $\hat{E}sn_1 / N_{oc1}$ is the ratio of nCell1 signal / AWGN $\hat{E}sn_2 / N_{oc1}$ is the ratio of nCell2 signal / AWGN
4.2.20 E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
4.2.21 E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis	Same as 4.2.20	Same as 4.2.20
4.2.22 E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Same as 4.2.1	
4.2.23 E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Same as 4.2.1	
4.2.24 HD – FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} $\hat{E}sn_2 / N_{oc1}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of Cell 1 signal / AWGN $\hat{E}sn_1 / N_{oc1}$ is the ratio of nCell1 signal / AWGN $\hat{E}sn_2 / N_{oc1}$ is the ratio of nCell2 signal / AWGN
4.2.28 E-UTRAN FDD – FDD Inter frequency case for CE UE in enhanced coverage	Same as 4.2.3	Same as 4.2.3
4.2.29 E-UTRAN HD – FDD Inter frequency case for CE UE in enhanced coverage	Same as 4.2.3	Same as 4.2.3

4.2.30 E-UTRAN TDD Inter frequency case for CE UE in enhanced coverage	Same as 4.2.3	Same as 4.2.3
4.2.35 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage	Same as 4.2.18	Same as 4.2.18
4.2.36 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	Same as 4.2.19	Same as 4.2.19
4.2.37 E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	Same as 4.2.24	Same as 4.2.24
4.2.38 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage with serving cell RRM measurement relaxation	Same as 4.2.18	Same as 4.2.18
4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth	Same as 4.3.1.2	

4.3.1.5 Idle mode FDD to UTRA FDD interRAT reselection	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cells I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: E-UTRA Cell 1: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN UTRA Cells 2 and 3: I_{oc} is the AWGN on cell 2 and cell 3 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 and cell 3 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 and cell 3 power assigned to the CPICH Physical channel
4.3.2 E-UTRA FDD - UTRAN TDD cell re-selection	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB $\hat{I}_{or} / I_{oc}$ ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.3.2A E-UTRA FDD to UTRA TDD cell re-selection for IncMon	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cells I_{oc} ±0.7 dB $\hat{I}_{or} / I_{oc}$ ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 and cell 3 frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 and cell 3 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 and cell 3 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 and cell 3 power assigned to the DwPCH channel
4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	Same as 4.3.1.2	
4.3.3A Idle mode TDD to UTRA FDD interRAT reselection	Same as 4.3.1.5	Same as 4.3.1.5
4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of higher priority	E-UTRA cell Noc ±1.0 dB averaged over BWConfig Ês / Noc ±0.3 dB averaged over BWConfig UTRA cell Ioc ±0.7 dB Îor / Ioc ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: Noc is the AWGN on cell 1 frequency Ês / Noc is the ratio of cell 1 signal / AWGN Ioc is the AWGN on cell 2 frequency Îor / Ioc is the ratio of cell 2 signal / AWGN PCCPCH Ec / Ior is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.3.4.2 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of lower priority	Same as 4.3.2	

4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB $\hat{I}_{or} / I_{oc}$ ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 (E-UTRA) frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.3.4.4 E-UTRA TDD to UTRA TDD cell re-selection for IncMon	Same as 4.3.2	Same as 4.3.2A
4.4.1 E-UTRAN FDD - GSM cell re-selection	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	
4.5.1.1 RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} HRPD cell I_{oc} ±2.0 dB $\hat{I}_{or} / I_{oc}$ ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (HRPD) frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 signal / AWGN
4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Same as 4.5.1.1	Same as 4.5.1.1
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1

5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
5.1.3_2 E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis	Same as 5.1.3	Same as 5.1.3
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.4_2 E-UTRAN TDD – TDD Inter frequency handover for UE Category 1bis	Same as 5.1.3	Same as 5.1.3
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	Same as 5.1.1	Same as 5.1.1
5.1.5_2 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell for UE Category 1bis	Same as 5.1.1	Same as 5.1.1
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	Same as 5.1.1	Same as 5.1.1
5.1.6_2 E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell for UE Category 1bis	Same as 5.1.1	Same as 5.1.1
5.1.7 E-UTRAN FDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.7_2 E-UTRAN FDD – TDD Inter frequency handover for UE Category 1bis	Same as 5.1.3	Same as 5.1.3
5.1.8 E-UTRAN TDD-FDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.8_2 E-UTRAN TDD – FDD Inter frequency handover for UE Category 1bis	Same as 5.1.3	Same as 5.1.3
5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth	Same as 5.1.1	Same as 5.1.1
5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.13 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.1.14 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.1.15 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.1.16 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB	Same as 5.1.1	Same as 5.1.1
5.1.17 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB	Same as 5.1.1	Same as 5.1.1

5.1.18 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeB	Same as 5.1.1	Same as 5.1.1
5.1.19 E-UTRAN FDD - FDD Intra frequency handover for UE Category 1bis	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
5.1.20 E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis	Same as 5.1.19	Same as 5.1.19
5.1.28 E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA	Same as 5.1.3	Same as 5.1.3
5.1.34 E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA without SFN acquisition	Same as 5.1.1	Same as 5.1.1
5.2.1 E-UTRAN FDD - UTRAN FDD handover	E-UTRA cell N_{oc} ±1.0dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH Ec/I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH Ec / Ior is the fraction of cell 2 power assigned to the CPICH Physical channel
5.2.2 E-UTRAN TDD - UTRAN FDD handover	Same as 5.2.1	Same as 5.2.1
5.2.3 E-UTRAN FDD - GSM handover	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
5.2.4 E-UTRA TDD – UTRA TDD handover	E-UTRA Cell: N_{oc} ± 1.0 dB averaged over BW_{Config} $\hat{E}_s / N_{oc}$ ± 0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ± 0.7 dB $\hat{I}_{or} / I_{oc}$ ± 0.3 dB P-CCPCH_E_c / I_{or} ± 0.1 dB DwPCH_E_c / I_{or} ± 0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}_s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 signal / AWGN P-CCPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the P-CCPCH physical channel. DwPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the DwPCH channel
5.2.5 E-UTRA FDD – UTRA TDD handover	Same as 5.2.4	Same as 5.2.4
5.2.6 E-UTRA TDD - GSM handover	Same as 5.2.3	Same as 5.2.3
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction on Cell 2 power assigned to the CPICH physical channel
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	Same as 5.2.3	Same as 5.2.3

5.2.9 E-UTRAN TDD – GSM handover: unknown target cell	Same as 5.2.3	Same as 5.2.3
5.2.10 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA TDD cell I_{oc} ±0.7 dB Ior/Ioc ±0.3 dB PCCPCH_Ec /Ior ±0.1 dB DwPCH_Ec /Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA TDD) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN PCCPCH_Ec /Ior is the fraction of Cell 2 power assigned to the PCCPCH physical channel DwPCH_Ec /Ior is the fraction of Cell 2 power assigned to the DwPCH physical channel
5.2.11 E-UTRAN FDD – UTRAN FDD Handover for 5MHz Bandwidth	Same as 5.2.1	Same as 5.2.1
5.3.1 RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} HRPD cell I_{oc} ±2.0 dB $\hat{I}_{or} / I_{oc}$ ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (HRPD) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN
5.3.5 E-UTRAN TDD - HRPD handover	Same as 5.3.1	Same as 5.3.1
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	Same as 5.1.1	Same as 5.1.1
6.1.1_2 E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.1	Same as 6.1.1
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
6.1.2_2 E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.2	Same as 6.1.2
6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment	Same as 6.1.1	Same as 6.1.1
6.1.3_2 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.1	Same as 6.1.1
6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment	Same as 6.1.3	Same as 6.1.3
6.1.4_2 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.2	Same as 6.1.2
6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Same as 6.1.1	Same as 6.1.1
6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.6	Same as 6.1.6

6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.6	Same as 6.1.6
6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.1.15 HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_{n1} / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_{n2} / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of eCell 1 signal / AWGN $\hat{E}s_{n1} / N_{oc}$ is the ratio of nCell 1 signal / AWGN $\hat{E}s_{n2} / N_{oc}$ is the ratio of nCell 2 signal / AWGN
6.1.16 HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage	Same as 6.1.15	Same as 6.1.15
6.1.18 E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA	Same as 6.1.2	Same as 6.1.2
6.1.23 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage	Same as 6.1.15	Same as 6.1.15
6.1.24 E-UTRAN TDD - TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage	Same as 6.1.15	Same as 6.1.15
6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2: N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.1_2 E-UTRAN FDD - Contention Based Random Access Test for UE Category 1bis	Same as 6.2.1	Same as 6.2.1
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.2_2 E-UTRAN FDD - Non Contention Based Random Access Test for UE Category 1bis	Same as 6.2.1	Same as 6.2.1

6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.3_2 E-UTRAN TDD - Contention Based Random Access Test for UE Category 1bis	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.4_2 E-UTRAN TDD - Non Contention Based Random Access Test for UE Category 1bis	Same as 6.2.1	Same as 6.2.1
6.2.5 E-UTRAN FDD – Contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1
6.2.6 E-UTRAN FDD – Non-contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1
6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG	Test 1, Test 2 and Test 3 N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG	Same as 6.2.7	Same as 6.2.7
6.2.9 3DL/3UL TDD CA Non-Contention Based Random Access Test for 2 SCells	Test 1, Test 2 and Test 3 N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

6.2.10 E-UTRAN FDD - Contention based random access test for Cat-M1 UEs in normal coverage	Test 1 and Test 2: N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.11 E-UTRAN HD-FDD - Contention based random access test for Cat-M1 UEs in normal coverage	Same as 6.2.10	Same as 6.2.10
6.2.12 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Same as 6.2.10	Same as 6.2.10
6.2.13 E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Test 1 and Test 2: N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.14 E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13
6.2.15 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13
6.2.16 Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage	N_{oc} ±1.0 dB averaged over NB-IoT Cell BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over NB-IoT Cell BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s / N_{oc}$ is the ratio of Ncell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.17 Contention Based Random Access Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Same as 6.2.16	Same as 6.2.16
6.2.18 Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Same as 6.2.16	Same as 6.2.16
6.2.19 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage	Same as 6.2.16	Same as 6.2.16
6.2.20 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in enhanced coverage	Same as 6.2.16	Same as 6.2.16

6.2.21 TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Same as 6.2.17	Same as 6.2.17
6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB SCH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior and SCH_Ec/Ior are the fractions of Cell 2 power assigned to the CPICH and SCH physical channels
6.3.1_2 Redirection from E-UTRAN FDD to UTRAN FDD for UE Category 1bis	Same as 6.3.1	Same as 6.3.1
6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1
6.3.2_2 Redirection from E-UTRAN TDD to UTRAN FDD for UE Category 1bis	Same as 6.3.1	Same as 6.3.1
6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
6.3.3_2 Redirection from E-UTRAN FDD to GERAN when System Information is provided for UE Category 1bis	Same as 6.3.3	Same as 6.3.3
6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3
6.3.4_2 Redirection from E-UTRAN TDD to GERAN when System Information is provided for UE Category 1bis	Same as 6.3.3	Same as 6.3.3
6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB PCCPCH_Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or} / I_{oc}$ is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
6.3.5_2 E-UTRA TDD RRC connection release redirection to UTRA TDD for UE Category 1bis	Same as 6.3.5	Same as 6.3.5
6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5
6.3.6_2 E-UTRA FDD RRC connection release redirection to UTRA TDD for UE Category 1bis	Same as 6.3.5	Same as 6.3.5
6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5

6.3.7_2 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis	Same as 6.3.5	Same as 6.3.5
6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5
6.3.8_2 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for UE Category 1bis	Same as 6.3.5	Same as 6.3.5
6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Same as 6.3.1	Same as 6.3.1
6.3.9_2 Redirection from E-UTRAN FDD to UTRAN FDD without System Information for UE Category 1bis	Same as 6.3.1	Same as 6.3.1
6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3
6.3.10_2 Redirection from E-UTRAN FDD to GERAN when System Information is not provided for UE Category 1bis	Same as 6.3.3	Same as 6.3.3
6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3
6.3.11_2 Redirection from E-UTRAN TDD to GERAN when System Information is not provided for UE Category 1bis	Same as 6.3.3	Same as 6.3.3
6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Same as 6.3.1	Same as 6.3.1
6.3.12_2 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided for UE Category 1bis	Same as 6.3.1	Same as 6.3.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.1_2 E-UTRAN FDD - UE Transmit Timing Accuracy for UE category 1bis	Same as 7.1.1	Same as 7.1.1
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Same as 7.1.1	Same as 7.1.1
7.1.2_2 E-UTRAN TDD - UE Transmit Timing Accuracy for UE category 1bis	Same as 7.1.1	Same as 7.1.1
7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s1} / N_{oc1}$ ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s2} / N_{oc2}$ ±0.3 dB ±3T_S Uplink signal transmit timing relative to downlink ±0.5T_S relative during UE timing adjustment	Note: $\hat{E}s / N_{oc}$ is the ratio of cell signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Same as 7.1.3	Same as 7.1.3

7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	Same as 7.1.3	Same as 7.1.3
7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Same as 7.1.3	Same as 7.1.3
7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Same as 7.1.3	Same as 7.1.3
7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Same as 7.1.1	Same as 7.1.1
7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s1}$ / N_{oc1} ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s2}$ / N_{oc2} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $\hat{E}s$ / N_{oc} is the ratio of cell signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Same as 7.1.6	Same as 7.1.6
7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.1.6	Same as 7.1.6
7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.1.6	Same as 7.1.6
7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.13 3DL/3UL TDD CA UE Transmit Timing Accuracy Tests for 2 Scells	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s1}$ / N_{oc1} ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s2}$ / N_{oc2} ±0.3 dB N_{oc3} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s3}$ / N_{oc3} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $\hat{E}s$ / N_{oc} is the ratio of cell signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Same as 7.1.1	Same as 7.1.1
7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Same as 7.1.1	Same as 7.1.1
7.1.16 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Same as 7.1.1	Same as 7.1.1

7.1.17 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $\hat{E}s / N_{oc}$ is the ratio of Ncell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.18 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under enhanced coverage	N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s / N_{oc}$ is the ratio of Ncell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.21 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.22 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.23 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for CE UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.24 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for CE UE in CEModeB	Same as 7.1.1	Same as 7.1.1
7.1.27 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Same as 7.1.17	Same as 7.1.17
7.1.28 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	Same as 7.1.18	Same as 7.1.18
7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB Timing Advance Adjustment: ±0.5T_s	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN The timing unit T_S = 1/(15000 * 2048) seconds, as defined in TS.36.211 [9]
7.2.1_2 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Same as 7.2.1	Same as 7.2.1
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.1	Same as 7.2.1
7.2.2_2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Same as 7.2.1	Same as 7.2.1
7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	Same as 7.2.1	Same as 7.2.1
7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB Timing Advance Adjustment: ±0.5T_s	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN The timing unit T_S = 1/(15000 * 2048) seconds, as defined in TS.36.211 [9]
7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.4	Same as 7.2.4
7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.2.1	Same as 7.2.1

7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.2.1	Same as 7.2.1
7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1
7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1
7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1
7.2.9 HD-FDD UE Timing Advance Adjustment Accuracy Test for Category NB1 UE in Standalone Mode under Enhance Coverage	Same as 7.2.1	Same as 7.2.1
7.2.10 E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1
7.2.11 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1
7.2.12 E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1
7.2.13 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for sTTI and Short Processing Time	Same as 7.2.1	Same as 7.2.1
7.2.14 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for sTTI and Short Processing Time	Same as 7.2.1	Same as 7.2.1
7.2.15 E-UTRAN TDD – TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage	Same as 7.2.1	Same as 7.2.1

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	± 0.6dB (Subtest 1&2, AWGN conditions) ± 0.8dB (Subtest 3, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 4, Fading conditions, two antenna transmission)	Subtests 1 & 2: Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB Subtests 3: Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.5 dB for single Tx Subtest 4: Same calculations as for subtest 3 but with Fading profile uncertainty of ±0.7 for two Tx.
7.3.1_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Same as 7.3.1	Same as 7.3.1
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	± 0.8dB (Subtest 1, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 2, Fading conditions, two antenna transmission)	Subtest 1: See 7.3.1 subtest 3 Subtest 2: See 7.3.1 subtest 4
7.3.2_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Same as 7.3.2	Same as 7.3.2
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Same as 7.3.1	Same as 7.3.1
7.3.3_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	Same as 7.3.2	Same as 7.3.2
7.3.4_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Same as 7.3.4	Same as 7.3.4

7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports	Same as 7.3.5	Same as 7.3.5
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1
7.3.6_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports	Same as 7.3.6	Same as 7.3.6
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.7_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports	Same as 7.3.7	Same as 7.3.7
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1
7.3.8_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports	Same as 7.3.8	Same as 7.3.8
7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell 1: $\hat{E}s_1/N_{oc}$ ± 0.9 dB Cell 2: $\hat{E}s_2/N_{oc}$ ± 0.9 dB $\hat{E}s_2/\hat{E}s_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $\hat{E}s/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $\hat{E}s_2/\hat{E}s_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_2/Es_1. $\hat{E}s_1/N_{oc}$ or $\hat{E}s_2/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $\hat{E}s_2/\hat{E}s_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) <u>Component uncertainties:</u> Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9

7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell 1: $\hat{E}s_1/N_{oc}$ ± 0.9 dB Cell 2: $\hat{E}s_2/N_{oc}$ ± 0.9 dB $\hat{E}s_2/\hat{E}s_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $\hat{E}s/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $\hat{E}s_2/\hat{E}s_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_2/Es_1. $\hat{E}s_1/N_{oc}$ or $\hat{E}s_2/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $\hat{E}s_2/\hat{E}s_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) <u>Component uncertainties:</u> Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11
7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9
7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9
7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11
7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11

7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Cell 1: $\hat{E}s_1/N_{oc}$ ± 0.9 dB Cell 2: $\hat{E}s_2/N_{oc}$ ± 0.9 dB Cell 3: $\hat{E}s_3/N_{oc}$ ± 0.9 dB $\hat{E}s_2/\hat{E}s_1$ ± 1.1 dB $\hat{E}s_3/\hat{E}s_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $\hat{E}s/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $\hat{E}s_2/\hat{E}s_1$ and $\hat{E}s_3/\hat{E}s_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_x/Es_1. $\hat{E}s_1/N_{oc}$, $\hat{E}s_2/N_{oc}$ or $\hat{E}s_3/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $\hat{E}s_2/\hat{E}s_1$ or $\hat{E}s_3/\hat{E}s_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) Component uncertainties: Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Cell 3 SNR uncertainty (E_{s3} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	± 0.9dB (Subtest 4, Fading conditions, two antenna transmission)	See 7.3.1, subtest 4

7.3.23_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth with 4 Rx antenna ports	Same as 7.3.23	Same as 7.3.23
7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	± 0.9dB (Subtest 2, Fading conditions, two antenna transmission)	See 7.3.2, subtest 2
7.3.24_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth with 4 Rx antenna ports	Same as 7.3.24	Same as 7.3.24
7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	±0.6dB (AWGN conditions)	See 7.3.1, subtest 1
7.3.25_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth with 4 Rx antenna ports	Same as 7.3.25	Same as 7.3.25
7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx
7.3.26_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	Same as 7.3.26	Same as 7.3.26
7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.27_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 1bis	Same as 7.3.26	Same as 7.3.26
7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.28_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	Same as 7.3.28	Same as 7.3.28
7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28

7.3.29_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	Same as 7.3.28	Same as 7.3.28
7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	[Same as 7.3.26
7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.34_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	Same as 7.3.26	Same as 7.3.26
7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.35_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE Category 1bis	Same as 7.3.26	Same as 7.3.26
7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.36_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	Same as 7.3.28	Same as 7.3.28
7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.37_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	Same as 7.3.28	Same as 7.3.28
7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx
7.3.38_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with 4 Rx antenna ports	Same as 7.3.38	Same as 7.3.38
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	Same as 7.3.38	Same as 7.3.38
7.3.39_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC with 4 Rx antenna ports	Same as 7.3.39	Same as 7.3.39

7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Same as 7.3.38	Same as 7.3.38
7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	Same as 7.3.41	Same as 7.3.41
7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Same as 7.3.41	Same as 7.3.41
7.3.44 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD	Same as 7.3.38	Same as 7.3.38
7.3.45 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD	Same as 7.3.38	Same as 7.3.38
7.3.46 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD	Same as 7.3.41	Same as 7.3.41
7.3.47 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD	Same as 7.3.41	Same as 7.3.41
7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx

7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx
7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx
7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx
7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Same as 7.3.28	Same as 7.3.28

7.3.56:E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Same as 7.3.48	Same as 7.3.48
7.3.57:E-UTRAN TDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Same as 7.3.48	Same as 7.3.48
7.3.58:E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.59:E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Same as 7.3.28	Same as 7.3.28
7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	Same as 7.3.28	Same as 7.3.28
7.3.62 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Enhanced Coverage	Same as 7.3.28	Same as 7.3.28
7.3.63 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Normal Coverage	Same as 7.3.28	Same as 7.3.28
7.3.64 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.65 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.66 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 Standalone mode in Normal Coverage	Same as 7.3.64	Same as 7.3.64

7.3.67 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 guard band mode in Enhanced Coverage	Same as 7.3.64	Same as 7.3.64
7.3.69 E-UTRAN HD-FDD Early Out-of-sync reporting Test for CE UE in CEMode A	Same as 7.3.52	Same as 7.3.52
7.3.88 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Same as 7.3.28	Same as 7.3.28
7.3.89 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	Same as 7.3.28	Same as 7.3.28
7.4.1 E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.4.2 E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC	Same as 7.4.1	Same as 7.4.1
7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity	Same as 7.4.1	Same as 7.4.1
7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	N_{oc} ±3.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: Ês / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	N_{oc} ±3.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: Ês / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.6.1 E-UTRAN FDD-TDD CA interruption at SRS carrier based switching	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty 2 + (0.25 x AWGN flatness and signal flatness) 2) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB

7.6.2 E-UTRAN TDD-TDD CA interruption at SRS carrier based switching	Same as 7.6.1	Same as 7.6.1
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.1.3 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.1.5	Same as 8.1.5
8.1.7 UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of Cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of Cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of Cell 3 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB

8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth	Same as 8.1.1	Same as 8.1.1
8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth	Same as 8.1.3	Same as 8.1.3
8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.11_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis	Same as 8.1.11	Same as 8.1.11
8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.12_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.1.11	Same as 8.1.11
8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.13_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Same as 8.1.11	Same as 8.1.11
8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.17_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.1.11	Same as 8.1.11
8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.18_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Same as 8.1.11	Same as 8.1.11

8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
8.1.19_2 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis	Same as 8.1.19	Same as 8.1.19
8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.20_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis	Same as 8.1.19	Same as 8.1.19
8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.8 dB dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / Fading $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / Fading $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx antennas
8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23
8.1.26 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.27 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.28 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23

8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23
8.1.31 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.1.32 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.8 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx
8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.1.40 E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells	AWGN absolute power, Noc ±1.0 dB Ratio of cell 1 signal /No Fading, $\hat{E}s_1 / N_{oc}$ ±0.3 dB Ratio of cell 2 signal /No Fading, $\hat{E}s_2 / N_{oc}$ ±0.3 dB	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of Cell 1 signal / AWGN $\hat{E}sn_1 / N_{oc1}$ is the ratio of nCell1 signal / AWGN $\hat{E}sn_2 / N_{oc1}$ is the ratio of nCell2 signal / AWGN
8.1.41 E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB

8.1.42 E-UTRAN HD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap	Same as 8.1.41	Same as 8.1.41
8.2.1 E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.2.3 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
8.2.4 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.2.3	Same as 8.2.3
8.2.5 UE Measurement Procedures / E-UTRAN TDD-TDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Same as 8.1.7	Same as 8.1.7
8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 8.1.8	Same as 8.1.8
8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19
8.2.7_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis	Same as 8.1.19	Same as 8.1.19
8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19
8.2.8_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis	Same as 8.1.19	Same as 8.1.19
8.2.11 E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells	AWGN absolute power, Noc ±1.0 dB Ratio of cell 1 signal /No Fading, $\hat{E}s_1 / N_{oc}$ ±0.3 dB Ratio of cell 2 signal /No Fading, $\hat{E}s_2 / N_{oc}$ ±0.3 dB	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of Cell 1 signal / AWGN $\hat{E}sn_1 / N_{oc1}$ is the ratio of nCell1 signal / AWGN $\hat{E}sn_2 / N_{oc1}$ is the ratio of nCell2 signal / AWGN
8.2.14 E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE in CEModeA without gap	Same as 8.1.41	Same as 8.1.41

8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.1_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1
8.3.2_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells for UE category 1bis	Same as 8.3.1_2	Same as 8.3.1_2
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
8.3.3_2 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used for UE category 1bis	Same as 8.3.3	Same as 8.3.3

8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.3.4	Same as 8.3.4
8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	Same as 8.3.4	Same as 8.3.4
8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on cell 4 frequency $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN Each $\hat{E}s$ / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.8 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, non DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.3 dB averaged over BW_{Config}	N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on cell 4 frequency $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN
8.3.9 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	Same as 8.3.8	Same as 8.3.8

8.3.12 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.13 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	Same as 8.3.12	Same as 8.3.12
8.3.14 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.15 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Same as 8.3.14	Same as 8.3.14
8.3.16 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.3.12	Same as 8.3.12
8.3.17 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.3.12	Same as 8.3.12
8.3.18 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.3.14	Same as 8.3.14

8.3.19 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.3.14	Same as 8.3.14
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.4.1_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1
8.4.2_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.4.1_2	Same as 8.4.1_2
8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Same as 8.3.3	Same as 8.3.3
8.4.3_2 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used for UE category 1bis	Same as 8.3.3	Same as 8.3.3

8.4.4 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
8.4.5 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.4.4	Same as 8.4.4
8.4.6 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0	Same as 8.4.1	Same as 8.4.1
8.4.6_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 for UE category 1bis	Same as 8.4.1_2	Same as 8.4.1_2
8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group	Same as 8.3.7	Same as 8.3.7
8.4.8 TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.3.8	Same as 8.3.8
8.4.9 TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	Same as 8.3.9	Same as 8.3.9
8.4.12 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.4.13 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Same as 8.4.12	Same as 8.4.12
8.4.14 TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.4.12	Same as 8.4.12

8.4.15 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.4.12	Same as 8.4.12
8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRAN cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on Cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of Cell 1 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel
8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB SCH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel SCH Ec/Ior is the fraction of Cell 2 power assigned to the SCH physical channel
8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Same as 8.5.1	Same as 8.5.1
8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH E_c/I_{or} ±0.1 dB SCH E_c/I_{or} ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}_s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on Cell 2 (UTRA) frequency I_{or}/I_{oc} is the ratio of Cell 2 signal/AWGN CPICH E_c/I_{or} is the fraction of Cell 2 power assigned to the CPICH physical channel SCH E_c/I_{or} is the fraction of Cell 2 power assigned to the SCH physical channel
8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	Same as 8.5.4	Same as 8.5.4
8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth	Same as 8.5.1	Same as 8.5.1

8.5.8 E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA cells I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB SCH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cells 2, 3, 4 (UTRA) frequency Ior/Ioc is the ratio of Cells 2, 3, 4 signal/AWGN CPICH Ec/Ior is the fraction of Cells 2, 3, 4 power assigned to the CPICH physical channel SCH Ec/Ior is the fraction of Cells 2, 3, 4 power assigned to the SCH physical channel
8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	Same as 8.5.1	Same as 8.5.1
8.6.3 E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.5.8	Same as 8.5.8
8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty or I_{or} / I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty or I_{or} / I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	Same as 8.7.1	Same as 8.7.1
8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel

8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	E-UTRA cell Noc ±1.0 dB averaged over BW_{Config} Ês / Noc ±0.3 dB averaged over BW_{Config} UTRA cell Ioc ±0.7 dB Ior/Ioc ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: Noc is the AWGN on cell 1 frequency Ês / Noc is the ratio of cell 1 signal / AWGN Ioc is the AWGN on cell 2 (UTRA) frequency Ior / Ioc is the ratio of cell 2 signal / AWGN PCCPCH Ec/Ior is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
8.7.5 E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	E-UTRA cell N_{oc} ±1 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA) frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ês / N_{oc} uncertainty or I_{or} / I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty or I_{or} / I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cells 2, 3 and 4 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2. 3 or 4 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2, 3 or 4 power assigned to the DwPCH channel
8.7A.1 E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.7.5	Same as 8.7.5
8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
8.8.2 E-UTRAN FDD- GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.1	Same as 8.8.1

8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.6 dB averaged over BW_{Config} UTRA TDD cell I_{oc} ±0.7 dB Ior/Ioc ±0.6 dB PCCPCH_Ec /Ior ±0.1 dB DwPCH_Ec /Ior ±0.1 dB	N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA TDD) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN PCCPCH_Ec /Ior is the fraction on Cell 2 power assigned to the CPCCPCH physical channel DwPCH_Ec /Ior is the fraction on Cell 2 power assigned to the DwPCH physical channel $\hat{E}s / N_{oc}$ and Ior/Ioc uncertainty for fading condition comprise two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty
8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Same as 8.7.4	Same as 8.7.4
8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN	Same as 8.8.1	Same as 8.8.1
8.10.2 E-UTRAN TDD- GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.2	Same as 8.8.2
8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_2 / N_{oc2}$ uncertainty or $\hat{E}s_3 / N_{oc3}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Same as 8.11.1	Same as 8.11.1

8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Ioc is the AWGN on Cell 3 (UTRA) frequency Ior/Ioc is the ratio of Cell 3 signal/AWGN CPICH Ec/Ior is the fraction of Cell 3 power assigned to the CPICH physical channel $\hat{E}s_2 / N_{oc2}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN I_{oc} is the AWGN on cell 3 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 3 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 3 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 3 power assigned to the DwPCH channel $\hat{E}s_2 / N_{oc2}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ or I_{or}/I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB

8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Cell 3 (GSM) has only the wanted signal, without AWGN $\hat{E}s_1 / N_{oc1}$ uncertainty or $\hat{E}s_2 / N_{oc2}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Same as 8.11.5	Same as 8.11.5
8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1
8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1
8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4
8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1
8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1
8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4

8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ uncertainty and $\hat{E}s_3 / N_{oc2}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Same as 8.16.1	Same as 8.16.1
8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of Cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of Cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of Cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Same as 8.16.3	Same as 8.16.3
8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Same as 8.16.3	Same as 8.16.3

8.16.8 E-UTRAN TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Same as 8.16.3	Same as 8.16.3
8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.15 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.16 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Same as 8.16.37	Same as 8.16.37
8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17
8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.3	Same as 8.16.3
8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	Same as 8.16.1	Same as 8.16.1
8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Same as 8.16.1	Same as 8.16.1
8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	Same as 8.16.3	Same as 8.16.3

8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Same as 8.16.3	Same as 8.16.3
8.16.27 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_4 / N_{oc3}$ is the ratio of cell 4 signal / AWGN $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$ uncertainty and $\hat{E}s_4 / N_{oc3}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.28 E-UTRAN TDD-FDD 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD	Same as 8.16.27	Same as 8.16.27
8.16.29, 3DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27
8.16.30, 3DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27

8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc3}$ ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_4 / N_{oc3}$ is the ratio of cell 4 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	Same as 8.16.31	Same as 8.16.31
8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31
8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31
8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.37 3DL FDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35

8.16.38 3DL TDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	Same as 8.16.35	Same as 8.16.35
8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	Same as 8.16.35	Same as 8.16.35
8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.47 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17
8.16.48 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17
8.16.49 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17
8.16.50 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17

8.16.51 E-UTRAN 4 DL FDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.6 dB averaged over BW_{Config} $\hat{E}s_5$ / N_{oc4} ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN $\hat{E}s_5$ / N_{oc4} is the ratio of cell 5 signal / AWGN $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc3}, $\hat{E}s_4$ / N_{oc4} uncertainty and $\hat{E}s_5$ / N_{oc4} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.52 E-UTRAN 4 DL TDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51
8.16.53 4 DL PCell in FDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51
8.16.54 4 DL PCell in TDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51

8.16.55 4DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.3 dB averaged over BW_{Config} $\hat{E}s_5$ / N_{oc4} ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN $\hat{E}s_5$ / N_{oc4} is the ratio of cell 5 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.56 4DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.55	Same as 8.16.55
8.16.57 4DL FDD CA Activation and Deactivation of Known SCell in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.58 4DL TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.59 4DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57

8.16.60 4DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.61 4DL FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.62 4DL TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.63 4DL PCell in FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.64 4DL PCell in TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.65 5 DL FDD-TDD with PCell in FDD CA Event Triggered Reporting with 4 Deactivated SCells in Non-DRX	Same as 8.16.71	Same as 8.16.71
8.16.66 5 DL FDD-TDD with PCell in TDD CA Event Triggered Reporting with 4 Deactivated SCells in Non-DRX	Same as 8.16.71	Same as 8.16.71
8.16.67 5DL Pcell in FDD CA activation and deactivation of unknown SCell in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc4}$ ±0.3 dB averaged over BW_{Config} N_{oc5} ±1.0 dB averaged over BW_{Config} $\hat{E}s_5 / N_{oc5}$ ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN N_{oc5} is the AWGN on frequency 5 $\hat{E}s_5 / N_{oc5}$ is the ratio of cell 5 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.68 5DL Pcell in TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67
8.16.69 5DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67
8.16.70 5DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67

8.16.71 5 DL FDD CA Event Triggered Reporting with Deactivated SCells in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc4}$ ±0.6 dB averaged over BW_{Config} N_{oc5} ±1.0 dB averaged over BW_{Config} $\hat{E}s_5 / N_{oc5}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_6 / N_{oc5}$ ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN N_{oc5} is the AWGN on frequency 5 $\hat{E}s_5 / N_{oc5}$ is the ratio of cell 5 signal / AWGN $\hat{E}s_6 / N_{oc5}$ is the ratio of cell 6 signal / AWGN $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$, $\hat{E}s_5 / N_{oc5}$ uncertainty and $\hat{E}s_6 / N_{oc5}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.72 5 DL TDD CA Event Triggered Reporting with Deactivated SCells in Non-DRX	Same as 8.16.71	Same as 8.16.71
8.16.73 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.71	Same as 8.16.71
8.16.74 5DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.71	Same as 8.16.71
8.16.75 5DL PCell in FDD CA activation and deactivation of known SCell in non-DRX	Same as 8.16.67	Same as 8.16.67
8.16.76 5DL PCell in TDD CA activation and deactivation of known SCell in non-DRX	Same as 8.16.67	Same as 8.16.67
8.16.77 5DL FDD CA activation and deactivation of known SCell in non-DRX	Same as 8.16.67	Same as 8.16.67
8.16.78 E-UTRAN TDD 5DL CA activation and deactivation of known SCell in non-DRX	Same as 8.16.67	Same as 8.16.67

8.16.83 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.27	Same as 8.16.27
8.16.84 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.31	Same as 8.16.31
8.16.85 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.35	Same as 8.16.35
8.16.86 3 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.39	Same as 8.16.39
8.16.87 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.51	Same as 8.16.51
8.16.88 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.55	Same as 8.16.55
8.16.91 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.71	Same as 8.16.71
8.16.92 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.71	Same as 8.16.71
8.16.89 4 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.57	Same as 8.16.57
8.16.90 4 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.61	Same as 8.16.61
8.16.93 5 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.75	Same as 8.16.75
8.16.94 5 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.67	Same as 8.16.67

8.16.95 6DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc4}$ ±0.6 dB averaged over BW_{Config} N_{oc5} ±1.0 dB averaged over BW_{Config} $\hat{E}s_5 / N_{oc5}$ ±0.6 dB averaged over BW_{Config} N_{oc6} ±1.0 dB averaged over BW_{Config} $\hat{E}s_6 / N_{oc6}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_7 / N_{oc6}$ ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN N_{oc5} is the AWGN on frequency 5 $\hat{E}s_5 / N_{oc5}$ is the ratio of cell 5 signal / AWGN N_{oc6} is the AWGN on frequency 6 $\hat{E}s_6 / N_{oc6}$ is the ratio of cell 6 signal / AWGN $\hat{E}s_7 / N_{oc6}$ is the ratio of cell 7 signal / AWGN $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$, $\hat{E}s_5 / N_{oc5}$, $\hat{E}s_6 / N_{oc6}$ uncertainty and $\hat{E}s_7 / N_{oc6}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

8.16.99 7DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc4}$ ±0.6 dB averaged over BW_{Config} N_{oc5} ±1.0 dB averaged over BW_{Config} $\hat{E}s_5 / N_{oc5}$ ±0.6 dB averaged over BW_{Config} N_{oc6} ±1.0 dB averaged over BW_{Config} $\hat{E}s_6 / N_{oc6}$ ±0.6 dB averaged over BW_{Config} N_{oc7} ±1.0 dB averaged over BW_{Config} $\hat{E}s_7 / N_{oc7}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_8 / N_{oc7}$ ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN N_{oc5} is the AWGN on frequency 5 $\hat{E}s_5 / N_{oc5}$ is the ratio of cell 5 signal / AWGN N_{oc6} is the AWGN on frequency 6 $\hat{E}s_6 / N_{oc6}$ is the ratio of cell 6 signal / AWGN N_{oc7} is the AWGN on frequency 7 $\hat{E}s_7 / N_{oc7}$ is the ratio of cell 7 signal / AWGN $\hat{E}s_8 / N_{oc7}$ is the ratio of cell 8 signal / AWGN $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$, $\hat{E}s_5 / N_{oc5}$, $\hat{E}s_6 / N_{oc6}$, $\hat{E}s_7 / N_{oc7}$ uncertainty and $\hat{E}s_8 / N_{oc7}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

8.20.1 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 3 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_1 / N_{oc1}$ uncertainty, $\hat{E}s_2 / N_{oc2}$ uncertainty, $\hat{E}s_3 / N_{oc3}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.2 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.20.1	Same as 8.20.1
8.20.2A UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth	Same as 8.20.1	Same as 8.20.1
8.20.2B UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	Same as 8.20.1	Same as 8.20.1

8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel $\hat{E}s_1 / N_{oc1}$ uncertainty, $\hat{E}s_3 / N_{oc3}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel $\hat{E}s_1 / N_{oc1}$ uncertainty, $\hat{E}s_3 / N_{oc3}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ or I_{or}/I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Same as 8.20.4	Same as 8.20.4

8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	Same as 8.20.4	Same as 8.20.4
8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1
8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1
8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.3.1	Same as 8.3.1
8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.3.1	Same as 8.3.1
8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} CRS $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} CRS $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: CRS $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 CRS signal / AWGN CRS $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 CRS signal / AWGN CSI-RS $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 CSI-RS signal / AWGN CSI-RS $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 CSI-RS signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Same as 8.22.5	Same as 8.22.5

8.22.7 E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 CRS signal / AWGN $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 CRS signal / AWGN CSI-RS $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 CSI-RS signal / AWGN CSI-RS $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 CSI-RS signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	Same as 8.22.7	Same as 8.22.7
8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1
8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1

8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} CRS $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} CRS $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} CRS $\hat{E}s_3$ / N_{oc2} ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_3$ / N_{oc2} ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 CRS $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN CSI-RS $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 CRS $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 CRS signal / AWGN CRS $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 CRS signal / AWGN CSI-RS $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 CSI-RS signal / AWGN CSI-RS $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 CSI-RS signal / AWGN $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} uncertainty and $\hat{E}s_3$ / N_{oc2} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Same as 8.22.11	Same as 8.22.12
8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_1$ / N_{oc1} uncertainty, $\hat{E}s_2$ / N_{oc2} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.1	Same as 8.23.1
8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.1	Same as 8.23.1

8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc3}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 3 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_1 / N_{oc1}$ uncertainty, $\hat{E}s_2 / N_{oc2}$ uncertainty, $\hat{E}s_3 / N_{oc3}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty^2 + Fading profile power uncertainty^2) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.4	Same as 8.23.4
8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.4	Same as 8.23.4
8.26.1 E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell with FDD PCell in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.26.2 E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell with TDD PCell in non-DRX	Same as 8.26.1	Same as 8.26.1
8.26.3 E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

8.26.3A E-UTRAN FDD-FS3 3-DL Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_4 / N_{oc2}$ ±0.3 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_4 / N_{oc2}$ is the ratio of cell 4 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.26.4 E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX	Same as 8.26.3	Same as 8.26.3
8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	Same as 8.26.5	Same as 8.26.5
8.26.7 E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal	Same as 8.26.5	Same as 8.26.5
8.26.8 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal	Same as 8.26.5	Same as 8.26.5

8.26.9 E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.26.10 E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.26.9	Same as 8.26.9
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1	Same as 9.1.1.1
9.1.1.1_2 FDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.1.1	Same as 9.1.1.1
9.1.1.1_3 FDD Intra Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements	Same as 9.1.1.1	Same as 9.1.1.1
9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.1.2_2 FDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.1.2	Same as 9.1.1.2
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.1_2 TDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.1.1	Same as 9.1.1.1

9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2
9.1.2.2_2 TDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.1.2	Same as 9.1.1.2
9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.3.1_1 FDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.1_2 FDD - FDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.1_3 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Overlapping Carrier	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.1_4 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Non-Overlapping Carrier	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.2_1 FDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_1 TDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_2 TDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2_1 TDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.3.1	Same as 9.1.3.1
9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.5.1_1 FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.5.1	Same as 9.1.5.1
9.1.5.1_2 FDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.5.1	Same as 9.1.5.1

9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.5.2_1 FDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel 12 and forward)	Same as 9.1.5.2	Same as 9.1.5.2
9.1.5.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.5.2	Same as 9.1.5.2
9.1.6.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.6.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1	Same as 9.1.6.1
9.1.6.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1	Same as 9.1.6.1
9.1.7.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.7.1_1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1	
9.1.7.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.7.2_1 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.2_1	Same as 9.1.6.2_1
9.1.8.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.8.1_1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Same as 9.1.8.1	Same as 9.1.8.1

9.1.8.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.9.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.9.1_1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel 12 and forward)	Same as 9.1.8.1	Same as 9.1.8.1
9.1.9.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.10.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.10.1_1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)	Same as 9.1.8.1	
9.1.10.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.11.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.11.1_1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel 12 and forward)	Same as 9.1.8.1	
9.1.11.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #47-52 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #47-52 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.12.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.1	Same as 9.1.12.1
9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	

9.1.12.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.1	Same as 9.1.12.1
9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	
9.1.13.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.1	
9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	
9.1.13.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.2_1	Same as 9.1.12.2_1
9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.14.1_1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel 12 and forward)	Same as 9.1.14.1	Same as 9.1.14.1
9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over $BW_{Config}\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 3 signal / AWGN
9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.1	Same as 9.1.14.1
9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.2	
9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel 12 and forward)	Same as 9.1.16.1	Same as 9.1.16.1

9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.17.1 FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #10-15	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #10-15	Note: Noc1 is the AWGN on cell 1 frequency Ês1 / Noc1 is the ratio of cell 1 signal / AWGN Noc2 is the AWGN on cell 2 frequency Ês2 / Noc2 is the ratio of cell 2 signal / AWGN
9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.8 dB for PRBs #22-27 $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.8 dB for PRBs #22-27 $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.1	Same as 9.1.18.1
9.1.19.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	Same as 9.1.18.2	Same as 9.1.18.2
9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.20.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Same as 9.1.20.1	Same as 9.1.20.1
9.1.21.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Same as 9.1.20.2	Same as 9.1.20.2

9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Noc1 ±1.0 dB averaged over BWConfig Noc1 ±1.3 dB over UE Measurement bandwidth Noc2 ±1.0 dB averaged over BWConfig Noc2 ±1.3 dB over UE Measurement bandwidth Ês1 / Noc1, Ês2 / Noc2, Ês3 / Noc2 each ±0.3 dB averaged over BWConfig Ês1 / Noc1, Ês2 / Noc2, Ês3 / Noc2 each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: Noc1 is the AWGN on frequency 1 Ês1 / Noc1 is the ratio of cell 1 signal / AWGN Noc2 is the AWGN on frequency 2 Ês2 / Noc2 is the ratio of cell 2 signal / AWGN Ês3 / Noc2 is the ratio of cell 3 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 TS = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Same as 9.1.22	Same as 9.1.22
9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	Same as 9.1.24.1	Same as 9.1.24.1
9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	Same as 9.1.24.2	Same as 9.1.24.2
9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.1.1	Same as 9.1.1.1
9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.1.1	Same as 9.1.1.1
9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.27	Same as 9.1.27
9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 CRS $\hat{E}s_1 / N_{oc}$ and CRS $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1 / N_{oc}$ and CSI-RS $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} CRS $\hat{E}s_1 / N_{oc}$ and CRS $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27 CSI-RS $\hat{E}s_1 / N_{oc}$ and CSI-RS $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.29	Same as 9.1.29
9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
9.1.32 TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.32	Same as 9.1.32
9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN

9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.1.33	Same as 9.1.33
9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 CSI-RS $\hat{E}s_1$ / N_{oc1}, CSI-RS $\hat{E}s_2$ / N_{oc2}, and CSI-RS $\hat{E}s_3$ / N_{oc3} each ±0.3 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1$ / N_{oc1}, CSI-RS $\hat{E}s_2$ / N_{oc2}, and CSI-RS $\hat{E}s_3$ / N_{oc3} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 CSI-RS $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 CSI-RS $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN CSI-RS $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN
9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Same as 9.1.35	Same as 9.1.35
9.1.37 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc2}, $\hat{E}s_4$ / N_{oc3}, $\hat{E}s_5$ / N_{oc3} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc2}, $\hat{E}s_4$ / N_{oc3}, $\hat{E}s_5$ / N_{oc3} each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_4$ / N_{oc3} is the ratio of cell 4 signal / AWGN $\hat{E}s_5$ / N_{oc3} is the ratio of cell 5 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.38 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.39 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.39_1 3DL FDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37
9.1.40 3DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.40_1 3DL TDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37
9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2

9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2
9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2
9.1.44 4 DL CA PCell in FDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth N_{oc4} ±1.0 dB averaged over BW_{Config} N_{oc4} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc2}$, $\hat{E}s_4 / N_{oc3}$, $\hat{E}s_5 / N_{oc3}$, $\hat{E}s_6 / N_{oc4}$, $\hat{E}s_7 / N_{oc4}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc2}$, $\hat{E}s_4 / N_{oc3}$, $\hat{E}s_5 / N_{oc3}$, $\hat{E}s_6 / N_{oc4}$, $\hat{E}s_7 / N_{oc4}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_4 / N_{oc3}$ is the ratio of cell 4 signal / AWGN $\hat{E}s_5 / N_{oc3}$ is the ratio of cell 5 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_6 / N_{oc4}$ is the ratio of cell 6 signal / AWGN $\hat{E}s_7 / N_{oc4}$ is the ratio of cell 7 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.45 4 DL CA PCell in TDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44
9.1.46 4DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44
9.1.47 4DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44

9.1.48 5 DL FDD-TDD with PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth N_{oc4} ±1.0 dB averaged over BW_{Config} N_{oc4} ±1.3 dB over UE Measurement bandwidth N_{oc5} ±1.0 dB averaged over BW_{Config} N_{oc5} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc2}$, $\hat{E}s_4 / N_{oc3}$, $\hat{E}s_5 / N_{oc3}$, $\hat{E}s_6 / N_{oc4}$, $\hat{E}s_7 / N_{oc4}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc2}$, $\hat{E}s_4 / N_{oc3}$, $\hat{E}s_5 / N_{oc3}$, $\hat{E}s_6 / N_{oc4}$, $\hat{E}s_7 / N_{oc4}$, $\hat{E}s_8 / N_{oc5}$, $\hat{E}s_8 / N_{oc5}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_4 / N_{oc3}$ is the ratio of cell 4 signal / AWGN $\hat{E}s_5 / N_{oc3}$ is the ratio of cell 5 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_6 / N_{oc4}$ is the ratio of cell 6 signal / AWGN $\hat{E}s_7 / N_{oc4}$ is the ratio of cell 7 signal / AWGN N_{oc5} is the AWGN on frequency 5 $\hat{E}s_8 / N_{oc5}$ is the ratio of cell 8 signal / AWGN $\hat{E}s_9 / N_{oc5}$ is the ratio of cell 9 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 $T_S = 1/(15000 \times 2048)$ seconds, the basic timing unit defined in TS 36.211 [9]
9.1.49 5 DL FDD-TDD with PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48
9.1.50 5 DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48
9.1.51 5 DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48
9.1.52 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.53 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52
9.1.54 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52
9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.5 dB averaged over BW_{Config} N_{oc2} ±1.8 dB for PRBs #47-52 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #47-52	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGNNote:

9.1.56 FS3 Intra frequency absolute and relative RSRP accuracies with TDD PCell9.1.56 FS3 Intra frequency absolute and relative RSRP accuracies with TDD PCell	Same as 9.1.55	Same as 9.1.55
9.1.57 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.58 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57
9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57
9.1.60 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with FDD PCell	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth CRS $\hat{E}s_1 / N_{oc1}$, CRS $\hat{E}s_2 / N_{oc2}$, CRS $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} CSI-RS $\hat{E}s_2 / N_{oc2}$, CSI-RS $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} CRS $\hat{E}s_2 / N_{oc2}$, CRS $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB over UE Measurement bandwidth CSI-RS $\hat{E}s_1 / N_{oc1}$, CSI-RS $\hat{E}s_2 / N_{oc2}$, CSI-RS $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB over UE Measurement bandwidth	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN
9.1.61 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD PCell	Same as 9.1.60	Same as 9.1.60
9.1.68 3DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.37	Same as 9.1.37
9.1.69 4 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.44	Same as 9.1.44
9.1.70 5 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.48	Same as 9.1.48
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-2 7 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.1.1_1 FDD Intra Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.1.1	Same as 9.2.1.1
9.2.1.1_2 FDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis	Same as 9.2.1.1	Same as 9.2.1.1
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Same as 9.2.1.1	Same as 9.2.1.1

9.2.2.1_1 TDD Intra Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.1.1	Same as 9.2.1.1
9.2.2.1_2 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 1bis	Same as 9.2.1.1	Same as 9.2.1.1
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.3.1_2 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.1	Same as 9.2.3.1
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	
9.2.3.2_2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.1	Same as 9.2.3.1
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.1_1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy (Rel-12 and forward)	Same as 9.2.3.1	
9.2.4.1_2 TDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.1	Same as 9.2.3.1
9.2.4.2 TDD - TDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.2_1 TDD - TDD Inter Frequency Relative RSRQ Accuracy (Rel-12 and forward)	Same as 9.2.3.2	
9.2.4.2_2 TDD - TDD Inter Frequency Relative RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.1	Same as 9.2.3.1
9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.4A.1_2 FDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.4A.1	Same as 9.2.4A.1
9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Same as 9.2.4A.1	
9.2.4A.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE Category 1bis	Same as 9.2.4A.1	Same as 9.2.4A.1

9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.5.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.2.7.1	Same as 9.2.7.1
9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.10.1 TDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 9.2.9.1	
9.2.11.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #47-52 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #47-52 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.2.11.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 3 signal / AWGN
9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.2.15.1	Same as 9.2.15.1
9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.18.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth	Same as 9.2.18.1	
9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS
9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS

9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #22-27 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1
9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1
9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1

9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Same as 9.2.25.1	
9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.25.1	
9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.25.1	
9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Same as 9.2.28	Same as 9.2.28
9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Same as 9.2.30	Same as 9.2.30
9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.2.32	Same as 9.2.32

9.2.38 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.39 3DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.40 3DL FDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.41 3DL TDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1
9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1

9.2.45 4 DL CA PCell in FDD FDD-TDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BWConfig N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BWConfig N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BWConfig N_{oc3} ±1.3 dB over UE Measurement bandwidth N_{oc4} ±1.0 dB averaged over BWConfig N_{oc4} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$ each ±0.3 dB averaged over BWConfig $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 Ts = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.46 4DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.45	Same as 9.2.45
9.2.47 5 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BWConfig N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BWConfig N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BWConfig N_{oc3} ±1.3 dB over UE Measurement bandwidth N_{oc4} ±1.0 dB averaged over BWConfig N_{oc4} ±1.3 dB over UE Measurement bandwidth N_{oc5} ±1.0 dB averaged over BWConfig N_{oc5} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$, $\hat{E}s_5 / N_{oc5}$ each ±0.3 dB averaged over BWConfig $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$, $\hat{E}s_4 / N_{oc4}$, $\hat{E}s_5 / N_{oc5}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4 / N_{oc4}$ is the ratio of cell 4 signal / AWGN N_{oc4} is the AWGN on frequency 5 $\hat{E}s_5 / N_{oc5}$ is the ratio of cell 5 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 Ts = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.2.48 5 DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.47	Same as 9.2.47
9.2.51 FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB averaged over UE Measurement bandwidth N_{oc2} ±1.5 dB averaged over BW_{Config} N_{oc2} ±1.8 dB for PRBs #47-52 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB averaged over UE Measurement bandwidth Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.52 TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	Same as 9.2.51	Same as 9.2.51
9.2.55 3DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.2.38	Same as 9.2.38
9.2.56 4 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.2.45	Same as 9.2.45
9.2.57 5 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.2.47	Same as 9.2.47
9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy	Same as 9.3.1	
9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Same as 9.3.1	
9.4.1 E-UTRAN FDD – UTRA FDD CPICH Ec/No absolute accuracy	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
9.4.2 E-UTRAN TDD – UTRA FDD CPICH Ec/No absolute accuracy	Same as 9.4.1	Same as 9.4.1
9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Same as 9.4.1	Same as 9.4.1

9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB PCCPCH E_C/I_{or} ±0.1 dB DwPCH_E_C/I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the DwPCH channel
9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Same as 9.5.1	
9.6.1 GSM RSSI accuracy for E-UTRAN FDD	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell BCCH1 Signal level ±0.7 dB GSM cell BCCH 2 to 6 Signal level ±2.0 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN GSM cells BCCH 1 to 6 have only the wanted signal, without AWGN
9.6.2 GSM RSSI accuracy for E-UTRAN TDD	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell BCCH1 Signal level ±0.7 dB GSM cell BCCH 2 to 6 Signal level ±2.0 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN GSM cells BCCH 1 to 6 have only the wanted signal, without AWGN
9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN
9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.9.1.1	Same as 9.9.1.1
9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN
9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN
9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.9.2.1	Same as 9.9.2.1

9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN
9.11.1 FS3 average RSSI accuracy case (PCell using FDD)	Noc_1 ±1.0 dB averaged over BWConfig Noc_1 ±1.3 dB for measurement PRBs Noc_2 ±1.5 dB averaged over BWConfig Noc_2 ±1.8 dB for measurement PRBs $\hat{E}s_1 / Noc_1$ and $\hat{E}s_2 / Noc_2$ each ±0.3 dB averaged over BWConfig $\hat{E}s_1 / Noc_1$ and $\hat{E}s_2 / Noc_2$ each ±0.8 dB for measurement PRBs	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.11.2 FS3 average RSSI accuracy case (PCell using TDD)	Same as 9.11.1	Same as 9.11.1
9.12.1 FS3 channel occupancy test (PCell using FDD)	Same as 9.11.1	Same as 9.11.1
9.12.2 FS3 channel occupancy test (PCell using TDD)	Same as 9.11.1	Same as 9.11.1
10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	± 0.6dB	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	± 0.6dB	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
11.1 V2V UE Transmission Timing Accuracy Test	±3Ts Uplink signal transmit timing relative to GNSS synchronization source Absolute GNSS signal level, ±1 dB	Note: T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9] Same value as the A-GNSS Time Assistance tests in section 5 of TS 37.571-1

11.2 Interruptions due to V2V sidelink communication	N_{oc} ±3.0 dB averaged over BWConfig $\hat{E}_s$ / N_{oc} ±0.3 dB Absolute GNSS signal level, ±1 dB	Note: $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN Same value as the A-GNSS Time Assistance tests in section 5 of TS 37.571-1
12.1.1 V2X UE Transmission Timing Accuracy Test for eNB as Timing Reference	synchronization source N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to GNSS	Note: $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
12.1.2 V2X UE Transmission Timing Accuracy Test for SyncRef UE as Timing Reference	N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
12.2.1 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for eNB as Timing Reference	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN
12.2.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for SyncRef UE as Timing Reference	N_{oc} ±1.5 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s$ / N_{oc} is the ratio of SyncRef UE signal / AWGN
12.3.1 V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority	N_{oc2} ±1.0 dB averaged over BW_{Config} SCH $\hat{E}_{s1}$ / N_{oc} ±0.3 dB averaged over BW_{Config} SCH $\hat{E}_{s2}$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}_{s1}$ / N_{oc} is the ratio of SyncRef UE 1 signal / AWGN $\hat{E}_{s2}$ / N_{oc} is the ratio of SyncRef UE 2 signal / AWGN
12.3.2 V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority	N_{oc2} ±1.0 dB averaged over BW_{Config} SCH $\hat{E}_{s1}$ / N_{oc} ±0.3 dB averaged over BW_{Config} SCH $\hat{E}_{s2}$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}_{s1}$ / N_{oc} is the ratio of SyncRef UE 1 signal / AWGN $\hat{E}_{s2}$ / N_{oc} is the ratio of SyncRef UE 2 signal / AWGN
12.4 Congestion Control Measurement Test for V2X UE	N_{oc} ±1.5 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s$ / N_{oc} is the ratio of Active UE signal / AWGN
12.5 Interruptions due to V2X Sidelink Communication	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}_s$ / N_{oc} is the ratio of Active Sidelink UE signal / AWGN
12.6.1 V2X UE Autonomous Resource Selection/Reselection Tests for PSSCH-RSRP measurements	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}_s$ / N_{oc} is the ratio of Active Sidelink UE signal / AWGN
12.6.2 V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}_s$ / N_{oc} is the ratio of Active Sidelink UE signal / AWGN
In addition, the following Test System uncertainties and related constraints apply. Any additional constraints are defined in the specific tests.		
AWGN Bandwidth		≥ 1.08MHz, 2.7MHz, 4.5MHz, 9MHz, 13.5MHz, 18MHz; N_{RB} x 180kHz according to BW_{Config}
AWGN absolute power uncertainty		Test-specific
AWGN flatness and signal flatness, max deviation for any Resource Block, relative to average over BW_{Config}		±2 dB
AWGN peak to average ratio		≥10 dB @0.001%
Signal-to noise ratio uncertainty		Test-specific

Fading profile power uncertainty	±0.5 dB
Fading profile delay uncertainty, relative to frame timing	±5 ns (excludes absolute errors related to baseband timing)

F.2 Interpretation of measurement results (normative)

See TS 36.521-1 [10] Annex F2.

F.3 Test Tolerance and Derivation of Test Requirements (informative)

See TS 36.521-1 [10] Annex F3.

F.3.1 Measurement of test environments

See TS 36.521-1 [10] Annex F3.1.

F.3.2 Measurement of RRM requirements

Because the relationships between the Test system uncertainties and the Test Tolerances are often complex, it is not always possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 36 903 [20].

Table F.3.2-1: Derivation of Test Requirements (RRM tests)

Test	Minimum Requirement in TS 36.133	Test Tolerance (TT)	Test Requirement in TS 36.521-3
4.2.1 E-UTRA FDD – FDD cell re-selection intra frequency	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +16.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +13.00dB $\hat{E}_{s2}$ / N_{oc}: +16.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: +16.00dB $\hat{E}_{s2}$ / N_{oc}: +13.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +16.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +13.00dB $\hat{E}_{s2}$ / N_{oc}: +16.45dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: +16.45dB $\hat{E}_{s2}$ / N_{oc}: +13.00dB
4.2.2 E-UTRA TDD – TDD cell re-selection intra frequency	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: -4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +14.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +12.00dB	During T0: -1.35dB +0.3dB -1.35dB +0.4dB During T1: -1.35dB +2.4dB -1.35dB +0.3dB During T2: -1.35dB +2.4dB -1.35dB 0dB During T3: -1.35dB +2.4dB -1.35dB +2.4dB	During T0: N_{oc1}: -99.35dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: -3.70dB N_{oc2}: -99.35dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +14.40dB During T1: N_{oc1}: -99.35dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -3.70dB During T2: N_{oc1}: -99.35dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T3: N_{oc1}: -99.35dBm /15kHz $\hat{E}_{s1}$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +14.40dB
4.2.4 E-UTRA FDD - TDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.5 E-UTRA TDD - FDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.7 E-UTRA FDD Inter frequency re-selection in the existence of non-allowed CSG cell	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +13.00dB $\hat{E}_{s3}$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -3.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB $\hat{E}_{s3}$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB $\hat{E}_{s3}$ / N_{oc1}: +13.00dB N_{oc2}: -98dBm/15kHz	During T0: 0dB 0dB 0dB 0dB 0dB During T1: 0dB -0.2dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +13.00dB $\hat{E}_{s3}$ / N_{oc1}: -infinitydB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -3.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +7.80dB $\hat{E}_{s3}$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB $\hat{E}_{s3}$ / N_{oc1}: +13.00dB N_{oc2}: -98dBm/15kHz

	$\hat{E}_{s2}$ / N_{oc2}: +13.00dB During T3: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +13.00dB $\hat{E}_{s3}$ / N_{oc1}: +38.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB	0dB During T3: 0dB 0dB 0dB 0dB 0dB	$\hat{E}_{s2}$ / N_{oc2}: +13.00dB During T3: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +13.00dB $\hat{E}_{s3}$ / N_{oc1}: +38.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB
4.2.8 E-UTRA TDD Inter frequency re-selection in the existence of non-allowed CSG cell	Same as 4.2.7	Same as 4.2.7	Same as 4.2.7
4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.10 E-UTRAN FDD – FDD reselection using an increased number of carriers	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -98dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -98dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +14.00dB N_{oc3}: -98dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -98dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -98dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +14.00dB N_{oc4}: -98dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T3: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -98dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -98dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +14.00dB During T4: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -98dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -98dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB	During T0: -1.15dB +1.10dB -1.15dB 0dB -1.15dB 0dB -1.15dB 0dB During T1: -1.15dB 0dB -1.15dB +1.10dB -1.15dB 0dB -1.15dB 0dB During T2: -1.15dB 0dB -1.15dB 0dB -1.15dB +1.10dB -1.15dB 0dB During T3: -1.15dB 0dB -1.15dB 0dB -1.15dB 0dB -1.15dB +1.10dB During T4: -1.15dB +1.10dB -1.15dB 0dB -1.15dB 0dB -1.15dB 0dB	During T0: N_{oc1}: -99.15dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +15.10dB N_{oc2}: -99.15dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -99.15dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -99.15dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T1: N_{oc1}: -99.15dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -99.15dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +15.10dB N_{oc3}: -99.15dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -99.15dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T2: N_{oc1}: -99.15dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -99.15dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -99.15dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +15.10dB N_{oc4}: -99.15dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB During T3: N_{oc1}: -99.15dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +8.00dB N_{oc2}: -99.15dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -99.15dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -99.15dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +15.10dB During T4: N_{oc1}: -99.15dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +15.10dB N_{oc2}: -99.15dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.00dB N_{oc3}: -99.15dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: +8.00dB N_{oc4}: -99.15dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: +8.00dB
4.2.11 E-UTRAN TDD – TDD	Same as 4.2.10	Same as 4.2.10	Same as 4.2.10

reselection using an increased number of carriers			
4.2.12 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +12.00dB $\hat{E}s_2 / N_{oc}$: +16.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: +12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +12.00dB $\hat{E}s_2 / N_{oc}$: +16.45dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +16.45dB $\hat{E}s_2 / N_{oc}$: +12.00dB
4.2.13 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.12	Same as 4.2.12	Same as 4.2.12
4.2.14 E-UTRA TDD - TDD intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.12	Same as 4.2.12	Same as 4.2.12
4.2.15 E-UTRAN FDD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -7.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -12.00dB $\hat{E}s_2 / N_{oc}$: -7.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: -7.00dB $\hat{E}s_2 / N_{oc}$: -12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -7.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -12.00dB $\hat{E}s_2 / N_{oc}$: -6.55dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: -6.55dB $\hat{E}s_2 / N_{oc}$: -12.00dB
4.2.16 E-UTRAN HD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.15	Same as 4.2.15	Same as 4.2.15
4.2.17 E-UTRAN TDD - TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.15	Same as 4.2.15	Same as 4.2.15
4.2.18 HD-FDD Intra frequency cell reselection for Category NB1 UE in In-Band Mode under Normal Coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 17.00dB $\hat{E}sn_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 13.00dB $\hat{E}sn_2 / N_{oc}$: 17.00dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 17.00dB $\hat{E}sn_2 / N_{oc}$: 13.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.45dB During T3: 0dB 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 17.00dB $\hat{E}sn_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 13.00dB $\hat{E}sn_2 / N_{oc}$: 17.45dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: 17.45dB $\hat{E}sn_2 / N_{oc}$: 13.00dB
4.2.19 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}s_2 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: -9.00dB $\hat{E}sn_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz	During T1: 0dB 0dB 0dB 0dB 0dB During T2: 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: 3.00dB $\hat{E}s_2 / N_{oc}$: 3.00dB $\hat{E}sn_1 / N_{oc}$: -9.00dB $\hat{E}sn_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz

	$\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}s_2$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -0.70dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}s_2$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -0.70dB $\hat{E}sn_2$ / N_{oc}: -9.00dB	0dB 0dB 0dB 0.45dB During T3: 0dB 0dB 0dB 0.45dB 0dB	$\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}s_2$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -0.25dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}s_2$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -0.25dB $\hat{E}sn_2$ / N_{oc}: -9.00dB
4.2.20 E-UTRAN FDD – FDD Intra frequency case for UE Category 1bis	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +17.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +13.00dB $\hat{E}s_2$ / N_{oc}: +17.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +17.00dB $\hat{E}s_2$ / N_{oc}: +13.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +17.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +13.00dB $\hat{E}s_2$ / N_{oc}: +17.45dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +17.45dB $\hat{E}s_2$ / N_{oc}: +13.00dB
4.2.21 E-UTRAN TDD – TDD Intra frequency case for UE Category 1bis	Same as 4.2.21	Same as 4.2.21	Same as 4.2.21
4.2.22 E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.23 E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.24 HD – FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -0.70dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -0.70dB $\hat{E}sn_2$ / N_{oc}: -9.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.45dB During T3: 0dB 0dB 0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -9.00dB $\hat{E}sn_2$ / N_{oc}: -0.25dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: -0.25dB $\hat{E}sn_2$ / N_{oc}: -9.00dB
4.2.28 E-UTRAN FDD – FDD Inter frequency case for CE UE in enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -5.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -5.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -5.00dB $\hat{E}s_2$ / N_{oc}: -12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0.5dB During T3: 0dB 0.5dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -5.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -4.50dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -4.50dB $\hat{E}s_2$ / N_{oc}: -12.00dB
4.2.29 E-UTRAN HD – FDD Inter	Same as 4.2.28	Same as 4.2.28	Same as 4.2.28

frequency case for CE UE in enhanced coverage			
4.2.30 E-UTRAN TDD Inter frequency case for CE UE in enhanced coverage	Same as 4.2.28	Same as 4.2.28	Same as 4.2.28
4.2.35 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage	Same as 4.2.18	Same as 4.2.18	Same as 4.2.18
4.2.36 E-UTRAN TDD – TDD Intra frequency case for UE Category NB1 In-Band mode in enhanced coverage	Same as 4.2.19	Same as 4.2.19	Same as 4.2.19
4.2.37 E-UTRAN TDD – TDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	Same as 4.2.24	Same as 4.2.24	Same as 4.2.24
4.2.38 HD – FDD Intra frequency case for UE Category NB1 In-Band mode in normal coverage with serving cell RRM measurement relaxation	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: 23.00dB $\hat{E}sn_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: 13.00dB $\hat{E}sn_2$ / N_{oc}: 17.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.45dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: 23.00dB $\hat{E}sn_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: 3.00dB $\hat{E}sn_1$ / N_{oc}: 13.00dB $\hat{E}sn_2$ / N_{oc}: 17.45dB
4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB	During T1: 0dB +1.05dB -0.1dB 0dB 0dB During T2: 0dB +1.05dB -0.1dB +0.9dB 0dB During T3: 0dB +1.05dB -0.1dB -0.7dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: +11.90dB CPICH_E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -5.70dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +12.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: -4.00dB UTRA Cell 2	During T1: -1.35dB +2.40dB 0dB +0.80dB 0dB During T2: -1.35dB +0.30dB	During T1: E-UTRA Cell 1 N_{oc}: -99.35dBm/15kHz $\hat{E}s$ / N_{oc}: +14.40dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -99.35dBm/15kHz $\hat{E}s$ / N_{oc}: -3.70dB UTRA Cell 2

	I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB	0dB +0.80dB 0dB	I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB	During T1,T2 0dB 0dB 0dB +0.80dB 0dB During T3,T4 0dB 0dB 0dB +0.80dB 0dB	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth	Same as 4.3.1.2		
4.3.1.5 Idle mode FDD to UTRA FDD interRAT reselection	During T0: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB During T2 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T3 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2	During T0: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T1: 0dB 0.3dB 0dB 0.8dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.8dB 0dB 0dB 0dB 0dB During T3: 0dB 0.3dB	During T0: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -3.70dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.80dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T2 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.80dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T3 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -3.70dB UTRA Cell 2

	I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T4 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB	0dB 0dB 0dB 0dB 0.8dB 0dB During T4: 0dB 0dB 0dB 0dB 0dB 0dB 0.8dB 0dB	I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.80dB CPICH_E_c/I_{or}: -10.00dB During T4 E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB UTRA Cell 3 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.80dB CPICH_E_c/I_{or}: -10.00dB
4.3.2 E-UTRA FDD - UTRAN TDD cell re-selection	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: +11.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0.1dB 0dB 0dB 0dB 0dB During T2: 0dB 0.1dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: +11.10dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: -3.1dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
4.3.2A E-UTRA FDD to UTRA TDD cell re-selection for IncMon	During T0: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: +11.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB	During T0: 0dB +0.5dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T1: 0dB -0.5dB 0dB 0dB 0dB 0dB 0dB 0dB	During T0: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: +11.05dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz $\hat{E}s$ / N_{oc}: -3.05dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB

	PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: -3.00dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: +11.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T04 E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB	0dB 0dB During T2: 0dB +0.5dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T3: 0dB -0.5dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T4: 0dB +0.5dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: +11.05dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: -3.05dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: +11.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T4: E-UTRA Cell 1 Noc: -98.0dBm/15kHz Ês / Noc: +11.05dB UTRA Cell 2 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB UTRA Cell 3 Ioc: -80.0dBm/1.28MHz Îor / Ioc: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB
4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	Same as 4.3.1.2	Same as 4.3.1.2	Same as 4.3.1.2
4.3.3A Idle mode TDD to UTRA FDD interRAT reselection	Same as 4.3.1.5	Same as 4.3.1.5	Same as 4.3.1.5
4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of higher priority	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Îor / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm /15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Îor / Ioc: +11.00dB	During T1: 0dB +0.1dB 0dB 0dB During T2: 0dB +0.1dB 0dB 0dB	During T1: Noc: -98.0dBm/15kHz Ês / Noc: +11.1dB Ioc: -80.0dBm/1.28MHz Îor / Ioc: -infinity During T2: Noc: -98.0dBm /15kHz Ês / Noc: +11.1dB Ioc: -80.0dBm/1.28MHz Îor / Ioc: +11.0dB

	PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Îor / Ioc: -3.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB	0dB 0dB During T3: 0dB +0.1dB 0dB 0dB 0dB 0dB	PCCPCH_E_c/I_{or}: -3dB DwPCH_E_c/I_{or}: 0dB During T3: N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +11.1dB I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_E_c/I_{or}: 0dB
4.3.4.2 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of lower priority	Same as 4.3.2	Same as 4.3.2	Same as 4.3.2
4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1, T2: 0dB 0dB 0dB 0dB 0dB 0dB During T3, T4: 0dB 0dB 0dB 0dB 0dB 0dB	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
4.3.4.4 E-UTRA TDD to UTRA TDD cell re-selection for IncMon	Same as 4.3.2A	Same as 4.3.2A	Same as 4.3.2A
4.4.1 E-UTRAN FDD - GSM cell re-selection	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +9.00dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB GSM Cell 2 Signal level: -75.0dBm	During T1: -1.4dB +1.5dB 0dB During T2: -1.4dB +0.3dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.40dBm/15kHz Ês / N_{oc}: +10.5dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -99.40dBm/15kHz Ês / N_{oc}: -3.70dB GSM Cell 2 Signal level: -75.00dBm
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	Same as 4.4.1	Same as 4.4.1
4.5.1.1 RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +9.00dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T1 -1.4dB 1.5dB 0dB 0dB During T2 -1.4dB 0.3dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.4dBm/15kHz Ês / N_{oc}: +10.5dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB During T2: E-UTRA Cell 1 N_{oc}: -99.4dBm/15kHz Ês / N_{oc}: -3.70dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB

4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Same as 4.5.1.1	Same as 4.5.1.1	Same as 4.5.1.1
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.50dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00 $\hat{E}s_2$ / N_{oc}: +11.50dB
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.5dB During T3: 0dB 0dB 0dB +0.5dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.50dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.50dB
5.1.3_2 E-UTRAN FDD – FDD Inter frequency handover for UE Category 1bis	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.0dB
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.4_2 E-UTRAN TDD – TDD Inter frequency handover for UE Category 1bis	Same as 5.1.3_2	Same as 5.1.3_2	Same as 5.1.3_2
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz

	Ês2 / Noc2: +7.0dB	0dB	Ês2 / Noc2: +7.0dB
5.1.5_2 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell for UE Category 1bis	Same as 5.1.5	Same as 5.1.5	Same as 5.1.5
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB
5.1.6_2 E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell for UE Category 1bis	Same as 5.1.6	Same as 5.1.6	Same as 5.1.6
5.1.7 E-UTRAN FDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.7_2 E-UTRAN FDD – TDD Inter frequency handover for UE Category 1bis	Same as 5.1.3_2	Same as 5.1.3_2	Same as 5.1.3_2
5.1.8 E-UTRAN TDD-FDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.8_2 E-UTRAN TDD – FDD Inter frequency handover for UE Category 1bis	Same as 5.1.3_2	Same as 5.1.3_2	Same as 5.1.3_2
5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.13 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.50dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.50dB
5.1.14 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.13	Same as 5.1.13	Same as 5.1.13
5.1.15 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.13	Same as 5.1.13	Same as 5.1.13
5.1.16 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2:	During T1: 0dB 0dB 0dB During T2:	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2:

	N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -7dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -7dB	0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -6.5dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -12.00 $\hat{E}s_2$ / N_{oc}: -6.5dB
5.1.17 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB	Same as 5.1.16	Same as 5.1.16	Same as 5.1.16
5.1.18 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeB	Same as 5.1.16	Same as 5.1.16	Same as 5.1.16
5.1.19 E-UTRAN FDD - FDD Intra frequency handover for UE Category 1bis	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +12.50dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00 $\hat{E}s_2$ / N_{oc}: +12.50dB
5.1.20 E-UTRAN TDD - TDD Intra frequency handover for UE Category 1bis	Same as 5.1.19	Same as 5.1.19	Same as 5.1.19
5.1.28 E-UTRAN HD-FDD inter frequency handover for CE UEs in CEModeA	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: -3dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4dB
5.1.34 E-UTRAN HD-FDD intra frequency handover for CE UEs in CEModeA without SFN acquisition	Same as 5.1.14 The Test Tolerance values are taken from the analysis for similar HD-FDD Test case 5.1.14 and no separate analysis is needed.	Same as 5.1.14 The Test Tolerance values are taken from the analysis for similar HD-FDD Test case 5.1.14 and no separate analysis is needed.	Same as 5.1.14 The Test Tolerance values are taken from the analysis for similar HD-FDD Test case 5.1.14 and no separate analysis is needed.
5.2.1 E-UTRAN FDD - UTRAN FDD handover	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity	During T1: 0dB -1.10dB 0dB -	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity

	During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB	During T2: 0dB -1.10dB 0dB 0dB During T3: 0dB -1.10dB 0dB 0dB	During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB
5.2.2 E-UTRAN TDD - UTRAN FDD handover	Same as 5.2.1	Same as 5.2.1	Same as 5.2.1
5.2.3 E-UTRAN FDD - GSM handover	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85dBm During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm During T3: E-UTRA Cell 1 N_{oc}: -98dBm /15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: E-UTRAN Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85dBm During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm During T3: E-UTRA Cell 1 N_{oc}: -98dBm /15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm
5.2.4 E-UTRA TDD – UTRA TDD handover	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: +13.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 11.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 11.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB	During T1: -1.05dB 2.1dB -0.8dB 0dB 0dB 0dB During T2: -1.05dB 0dB -0.8dB 1.6dB 0dB 0dB During T3: -1.05dB 0dB -0.8dB +1.6dB 0dB 0dB	During T1: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: +15.1dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: -3.0dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 12.6dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: -3.0dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 12.6dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB
5.2.5 E-UTRA FDD – UTRA TDD handover	Same as 5.2.4	Same as 5.2.4	Same as 5.2.4

5.2.6 E-UTRA TDD - GSM handover	Same as 5.2.3	Same as 5.2.3	Same as 5.2.3
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T1: 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
5.2.9 E-UTRAN TDD – GSM handover: unknown target cell	Same as 5.2.8	Same as 5.2.8	Same as 5.2.8
5.2.10 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: 13 dB PCCPCH_E_c/I_{or}: -3.00dB DwPCH_E_c/I_{or}: 0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: 13 dB PCCPCH_E_c/I_{or}: -3.00dB DwPCH_E_c/I_{or}: 0dB
5.2.11 E-UTRAN FDD – UTRAN FDD Handover for 5MHz Bandwidth	Same as 5.2.1	Same as 5.2.1	Same as 5.2.1
5.3.1 RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T1: 0dB -0.8dB 0dB During T2: 0dB -0.8dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB

	During T3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T3: 0dB -0.8dB 0dB 0dB	During T3: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB
5.3.5 E-UTRAN TDD - HRPD handover	Same as 5.3.1	Same as 5.3.1	Same as 5.3.1
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +7.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +7.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB
6.1.1_2 E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB
6.1.2_2 E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.2	Same as 6.1.2	Same as 6.1.2
6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.3_2 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment	Same as 6.1.3	Same as 6.1.3	Same as 6.1.3
6.1.4_2 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis	Same as 6.1.2	Same as 6.1.2	Same as 6.1.2
6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.6 E-UTRAN FD-FDD Intra-	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1

frequency RRC Re-establishment for UE category 0			
6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +7.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -15.00dB $\hat{E}_{s2}$ / N_{oc}: -12.00dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -12.00dB During T4: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB +0.6dB 0dB During T3: 0dB 0dB 0dB During T4: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +7.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -14.40dB $\hat{E}_{s2}$ / N_{oc}: -12.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -12.00dB
6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.12	Same as 6.1.12	Same as 6.1.12
6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.12	Same as 6.1.12	Same as 6.1.12
6.1.15 HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: +7.0dB $\hat{E}_{sn2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: -infinity $\hat{E}_{sn2}$ / N_{oc}: -12.6dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: -infinity $\hat{E}_{sn2}$ / N_{oc}: -12.6dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: +7.0dB $\hat{E}_{sn2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: -infinity $\hat{E}_{sn2}$ / N_{oc}: -12.6dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: -12.6dB $\hat{E}_{sn1}$ / N_{oc}: -infinity $\hat{E}_{sn2}$ / N_{oc}: -12.6dB
6.1.16 HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{sn1}$ / N_{oc}: +7.0dB	During T1: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{sn1}$ / N_{oc}: +7.0dB

	$\hat{E}_{s_{n2}}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s_1}$ / N_{oc}: +4.0dB $\hat{E}_{s_{n1}}$ / N_{oc}: -infinity $\hat{E}_{s_{n2}}$ / N_{oc}: +4.0dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s_1}$ / N_{oc}: +4.0dB $\hat{E}_{s_{n1}}$ / N_{oc}: -infinity $\hat{E}_{s_{n2}}$ / N_{oc}: +4.0dB	0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	$\hat{E}_{s_{n2}}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s_1}$ / N_{oc}: +4.0dB $\hat{E}_{s_{n1}}$ / N_{oc}: -infinity $\hat{E}_{s_{n2}}$ / N_{oc}: +4.0dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s_1}$ / N_{oc}: +4.0dB $\hat{E}_{s_{n1}}$ / N_{oc}: -infinity $\hat{E}_{s_{n2}}$ / N_{oc}: +4.0dB
6.1.18 E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for CE UE in CEModeA	Same as 6.1.2	Same as 6.1.2	Same as 6.1.2s
6.1.23 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage	Same as 6.1.16	Same as 6.1.16	Same as 6.1.16
6.1.24 E-UTRAN TDD - TDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under enhanced coverage	Same as 6.1.15	Same as 6.1.15	Same as 6.1.15
6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Uplink timing T_e: ±12T_s	 1.5dB 1.5dB 0.7dB 0.7dB 3T_s	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing T_e: ±15T_s
6.2.1_2 E-UTRAN FDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.2_2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.3_2 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.4_2 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.5 E-UTRAN FDD – Contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.6 E-UTRAN FDD – Non-contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG	Test 1, Test 2 and Test 3 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB	 1.5dB 1.5dB	Test 1, Test 2 and Test 3 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB

	Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Uplink timing T_e: ±12T_s	 0.7dB 0.7dB 3T_s	Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing T_e: ±15T_s
6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG	Same as 6.2.7	Same as 6.2.7	Same as 6.2.7
6.2.9 3DL/3UL TDD CA Non-Contention Based Random Access Test for 2 SCells	Same as 6.2.7	Same as 6.2.7	Same as 6.2.7
6.2.10 E-UTRAN FDD - Contention based random access test for Cat-M1 UEs in normal coverage	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Timing Te: ±24Ts rsrp-ThresholdsPrach {24, 27, 33} Noc: -103dBm/15kHz Ês / Noc: +3dB	 1.5dB 1.5dB 0.7dB 0.7dB 3Ts {0, 0, -2} for normal {-3, -3, -5} for extreme -0.4dB -0.3dB	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing Te: ±27Ts rsrp-ThresholdsPrach {24, 27, 31} for normal conditions and {21, 24, 28} for extreme conditions Noc: -103.4dBm/15kHz Ês / Noc: +2.7dB
6.2.11 E-UTRAN HD-FDD - Contention based random access test for Cat-M1 UEs in normal coverage	Same as 6.2.10	Same as 6.2.10	Same as 6.2.10
6.2.12 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Same as 6.2.1	Same as 6.2.10	Same as 6.2.10
6.2.13 E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Timing Te: ±48Ts rsrp-ThresholdsPrach {23, 37, 47} Noc: -98dBm/15kHz Ês / Noc: -12dB	 1.5dB 1.5dB 0.7dB 0.7dB 3Ts {-2, 1, 0} for normal {-5, 4, 3} for extreme -1.1dB 0.6dB	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing Te: ±51Ts rsrp-ThresholdsPrach {21, 38, 47} for normal conditions and {18, 41, 50} for extreme conditions Noc: -99.1dBm/15kHz Ês / Noc: -11.4dB
6.2.14 E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13	Same as 6.2.13
6.2.15 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13	Same as 6.2.13
6.2.16 Contention Based Random Access Test for UE	Absolute uplink power: Normal conditions ±9dB	 1.4dB	Absolute uplink power: Normal conditions ±10.4dB

category NB1 UEs In-band mode in normal coverage	Extreme conditions ±12dB Relative uplink power step: Normal conditions ±2dB Extreme conditions ±4dB Uplink timing T_e: ±80T_s rsrp-ThresholdsPrach {40, 55} Ês / Noc: 3dB	1.4dB 0.7dB 0.7dB 3T_s {0, -1} for normal {0, -4} for extreme 0.1dB	Extreme conditions ±13.4dB Relative uplink power step: Normal conditions ±2.7dB Extreme conditions ±4.7dB Uplink timing T_e: ±83T_s rsrp-ThresholdsPrach {40, 54} for normal conditions and {40, 51} for extreme conditions Ês / Noc: 3.1dB
6.2.17 Contention Based Random Access Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Absolute uplink power: Normal conditions ±13.3dB Extreme conditions ±16.3dB Relative uplink power step: Normal conditions ±2dB Extreme conditions ±4dB Uplink timing T_e: ±80T_s rsrp-ThresholdsPrach {35, 56}	 1.0dB 1.0dB 0.7dB 0.7dB 3T_s {-1, 1} for normal {-4, 4} for extreme	Absolute uplink power: Normal conditions ±14.3dB Extreme conditions ±17.3dB Relative uplink power step: Normal conditions ±2.7dB Extreme conditions ±4.7dB Uplink timing T_e: ±83T_s rsrp-ThresholdsPrach {34, 57} for normal conditions and {31, 60} for extreme conditions
6.2.18 Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Same as 6.2.17	Same as 6.2.17	Same as 6.2.17
6.2.19 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in normal coverage	Same as 6.2.16	Same as 6.2.16	Same as 6.2.16
6.2.20 TDD Contention Based Random Access Test for UE category NB1 UEs In-band mode in enhanced coverage	Same as 6.2.17	Same as 6.2.17	Same as 6.2.17
6.2.21 TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	Same as 6.2.17	Same as 6.2.17	Same as 6.2.17
6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.4dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.42dB
6.3.1_2 Redirection from E-UTRAN FDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.2_2 Redirection from E-UTRAN TDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB	During T1: 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB

	GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	 During T2: 0dB 0dB 0dB	GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
6.3.3_2 Redirection from E-UTRAN FDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.4_2 Redirection from E-UTRAN TDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +8.0dB PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +8.0dB PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB
6.3.5_2 E-UTRA TDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.6_2 E-UTRA FDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.7_2 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.8_2 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.9_2 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3

6.3.10_2 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.11_2 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.12_2 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: ±12T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: ±24T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 4.0T Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: ±15T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: ±27T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.1_1 E-UTRAN FDD - UE Transmit Timing Accuracy (Non DRx UE)	Test 1 (10MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: ±24T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: ±27T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.1_2 E-UTRAN FDD - UE Transmit Timing Accuracy for UE category 1bis	Same as 7.1.1	Same as 7.1.1	Same as 7.1.1
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±24) x T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±27) x T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.2_1 E-UTRAN TDD - UE	Test 1 (10MHz Ch BW):		Test 1 (10MHz Ch BW):

Transmit Timing Accuracy (Non DRx UE)	Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}s$ / N_{oc}: +3.00dB Test 2 not applicable <u>Test 3: (1.4MHz Ch BW)</u> Uplink timing: (624 ±24) x T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s $\hat{E}s$ / N_{oc}: +3.00dB	±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}s$ / N_{oc}: +3.30dB Test 2 not applicable <u>Test 3: (1.4MHz Ch BW)</u> Uplink timing: (624 ±27) x T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s $\hat{E}s$ / N_{oc}: +3.30dB
7.1.2_2 E-UTRAN TDD - UE Transmit Timing Accuracy for UE category 1bis	<u>Same as 7.1.2</u>	<u>Same as 7.1.2</u>	<u>Same as 7.1.2</u>
7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	<u>Test 1:</u> Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB <u>Test 2:</u> Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	<u>Test 1:</u> Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB <u>Test 2:</u> Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	<u>Test 1:</u> Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB <u>Test 2 and Test 3:</u> Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	<u>Test 1:</u> Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB <u>Test 2 and Test 3:</u> Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	<u>Test 1:</u> Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB <u>Test 2:</u> Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	<u>Test 1:</u> Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB <u>Test 2:</u> Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	<u>Test 1:</u> Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB <u>Test 2 and Test:</u> Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	<u>Test 1:</u> Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB <u>Test 2 and Test 3:</u> Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB

7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Same as 7.1.4	Same as 7.1.4	Same as 7.1.4
7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Test 1 (5MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 5.5T_s Min adjust rate: 11T_s in 1.57s Max adjust rate: 5.5T_s $\hat{E}s$ / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -5.3T_s +1.1T_s +0.3dB	Test 1 (5MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 6.0T_s Min adjust rate: 5.7T_s in 1.57s Max adjust rate: 6.6T_s $\hat{E}s$ / N_{oc}: +3.30dB
7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	Test 1: Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: ±15T_s Max step size T_q: 4.0T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Test 1: Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: (624 ±15) x T_s Max step size T_q: 4.0T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Sams as 7.1.7	Sams as 7.1.7	Sams as 7.1.7
7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Sams as 7.1.7	Sams as 7.1.7	Sams as 7.1.7
7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.13 3DL/3UL TDD CA UE Transmit Timing Accuracy Tests for 2 SCells	Test 1: Uplink timing: (624 ±12) x T_s Max step size T_q:	 ±3T_s	Test 1: Uplink timing: (624 ±15) x T_s Max step size T_q:

	5.5T_s for 5MHz BW 3.5T_s for ≥10 MHz BW Min adjust rate: 7T_s Max adjust rate: 5.5T_s for 5MHz BW 3.5T_s for ≥10 MHz BW $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB $\hat{E}_{s3}$ / N_{oc3}: +3.00dB Test 2: Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB $\hat{E}_{s3}$ / N_{oc3}: +3.00dB	+0.5T_s +0.5T_s -3.6T_s +1.1T_s +1.1T_s +0.3dB +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB +0.3dB	6.0T_s for 5MHz BW 4.0T_s for ≥10 MHz BW Min adjust rate: 3.4T_s Max adjust rate: 6.6T_s for 5MHz BW 4.6T_s for ≥10 MHz BW $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB $\hat{E}_{s3}$ / N_{oc3}: +3.30dB Test 2: Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB $\hat{E}_{s3}$ / N_{oc3}: +3.30dB
7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Uplink timing: ±48T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s $\hat{E}_s$ / N_{oc}: -12.00dB	±3T_s +0.5T_s +1.1T_s(f > 1GHz) +1.7T_s(f ≤ 1GHz) +0.3dB	Uplink timing: ±51T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s(f > 1GHz) Max adjust rate: 19.2T_s(f ≤ 1GHz) $\hat{E}_s$ / N_{oc}: -11.70dB
7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Same as 7.1.14	Same as 7.1.14	Same as 7.1.14
7.1.16 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Same as 7.1.14	Same as 7.1.14	Same as 7.1.14
7.1.17 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Test 1 Uplink timing: ±80T_s Max step size: 58.33T_s Min adjust rate: 7T_s Max adjust rate: 58.33T_s $\hat{E}_s$ / N_{oc}: +4.00dB	±3T_s +0.5T_s -3.6T_s for carrier frequency under 1 GHz -6.6T_s for carrier frequency over 1 GHz +1.1T_s for carrier frequency under 1 GHz +1.7 T_s for carrier frequency over 1 GHz +0.3dB	Test 1 Uplink timing: ±83T_s Max step size: 58.83T Min adjust rate: 3.4T_s for carrier frequency under 1 GHz 0.4T_s for carrier frequency over 1 GHz Max adjust rate: 59.43T_s for carrier frequency under 1 GHz 60.03T_s for carrier frequency over 1 GHz $\hat{E}_s$ / N_{oc}: +4.30dB
7.1.18 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under enhanced coverage	Test 1&Test 2 Uplink timing: ±80T_s Test 1 Uplink timing: 0T_s (during ongoing repetition) $\hat{E}_s$ / N_{oc}: +4.00dB	±3T_s ±3T_s +0.3dB	Test 1&Test 2 Uplink timing: ±83T_s Test 1 Uplink timing: ±3T_s (during ongoing repetition) $\hat{E}_s$ / N_{oc}: +4.30dB
7.1.21 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.22 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2

		Test 2	
7.1.23 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.24 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M2 UE in CEModeB	Uplink timing: ±40T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: -12.00dB	±3T_s +0.5T_s +1.1T_s(f > 1GHz) +1.7T_s(f ≤ 1GHz) +0.3dB	Uplink timing: ±43T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s(f > 1GHz) Max adjust rate: 19.2T_s(f ≤ 1GHz) Ês / N_{oc}: -11.70dB
7.1.27 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Same as 7.1.17	Same as 7.1.17	Same as 7.1.17
7.1.28 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	Same as 7.1.18	Same as 7.1.18	Same as 7.1.18
7.2.1 E-UTRAN FDD - UE Timing Advanced Adjustment Accuracy	Timing Advance Adjustment: ±4T_s	 0.5T_S	Timing Advance Adjustment: ±4.5T_s
7.2.1_2 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.2_2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy for UE category 1bis	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.9 HD-FDD UE Timing Advance Adjustment Accuracy Test for Category NB1 UE in	Timing Advance Adjustment: ±13.33T_s	0.5 T_S	Timing Advance Adjustment: ±13.83T_s

Standalone Mode under Enhance Coverage			
7.2.10 E-UTRAN FDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.11 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.12 E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test in CEModeB	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.13 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for sTTI and Short Processing Time	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.14 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for sTTI and Short Processing Time	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.15 E-UTRAN TDD – TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage	Same as 7.2.9	Same as 7.2.9	Same as 7.2.9
7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	0.6dB (Subtests 1&2) 0.8dB (Subtest 3) 0.9dB (Subtest 4)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT
7.3.1_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	SNRs as specified	0.8dB (Subtest 1) 0.9dB (Subtest 2)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT During T4: Formula: SNR - TT S During T5: Formula: SNR + TT
7.3.2_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	SNRs as specified	Same as 7.3.2	Same as 7.3.2
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.3_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	SNRs as specified	Same as 7.3.2	Same as 7.3.2
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.5_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports	SNRs as specified	Same as 7.3.5	Same as 7.3.5

7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
7.3.6_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports	SNRs as specified	Same as 7.3.6	Same as 7.3.6
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.7_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX with 4 Rx antenna ports	SNRs as specified	Same as 7.3.7	Same as 7.3.7
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
7.3.8_! E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX with 4 Rx antenna ports	SNRs as specified	Same as 7.3.8	Same as 7.3.8
7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2 (TT2)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2(TT2)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 During T4: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 During T5: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty

			TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11
7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11
7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11
7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2 (TT2) 0.2dB for cell 3 (TT3)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty) TT3: ($\hat{E}s_3/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17	Same as 7.3.17
7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2(TT2) 0.2dB for cell 3 (TT3)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T2:

ABS (feICIC)			Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 During T4: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 During T5: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty) TT3: ($\hat{E}s_3/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.23_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth with 4 Rx antenna ports	SNRs as specified	Same as 7.3.23	Same as 7.3.23
7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	SNRs as specified	0.9dB	Same as 7.3.2
7.3.24_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth with 4 Rx antenna ports	SNRs as specified	Same as 7.3.24	Same as 7.3.24
7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	SNRs as specified	0.6dB	Same as 7.3.2
7.3.25_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth with	SNRs as specified	Same as 7.3.25	Same as 7.3.25

4 Rx antenna ports			
7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	0.9dB	Same as 7.3.1
7.3.26_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.27_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 1bis	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	0.6dB	Same as 7.3.1
7.3.28_2 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.29_2 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.34_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 1bis	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.35_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE Category 1bis	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.36_2 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category 1bis	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.37_2 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category 1bis	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for	SNRs as specified	0.9dB	Same as 7.3.1

Out-of-sync in DRX in synchronous DC			
7.3.38_1 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with 4 Rx antenna ports	SNRs as specified	Same as 7.3.38	Same as 7.3.38
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	SNRs as specified	0.9dB	Same as 7.3.1
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC with 4 Rx antenna ports	SNRs as specified	Same as 7.3.39	Same as 7.3.39
7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	SNRs as specified	0.9dB	Same as 7.3.1
7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	SNRs as specified	0.6dB	Same as 7.3.2
7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	SNRs as specified	0.6dB	Same as 7.3.2
7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	SNRs as specified	0.6dB	Same as 7.3.2
7.3.44 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD	SNRs as specified	0.9dB	Same as 7.3.1
7.3.45 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD	SNRs as specified	0.9dB	Same as 7.3.1
7.3.46 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD	SNRs as specified	0.6dB	Same as 7.3.2
7.3.47 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD	SNRs as specified	0.6dB	Same as 7.3.2
7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.1
7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.2
7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.1
7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.2
7.3.52 E-UTRAN HD-FDD Radio	SNRs as specified	0.9dB	Same as 7.3.1

Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A			
7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.2
7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.1
7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.2
7.3.56:E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.1
7.3.57:E-UTRAN TDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.2
7.3.58:E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.1
7.3.59:E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.2
7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	SNRs as specified	0.6dB	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT During T4: Formula: SNR + TT
7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	SNRs as specified	0.6dB	Same as 7.3.60
7.3.62 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Enhanced Coverage	SNRs as specified Time durations as specified	0.6dB 0.28s, T2 only	During T1: Formula: SNR + TT T1 duration unchanged During T2: Formula: SNR - TT Formula: T2 duration -TT During T3: Formula: SNR + TT T3 duration unchanged
7.3.63 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Normal Coverage	SNRs as specified Time durations as specified	0.6dB 0.28s, T2 only	Same as 7.3.62
7.3.64 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage	SNRs as specified Time durations as specified	0.6dB 0.28s, T2 only	Same as 7.3.62
7.3.65 HD-FDD Radio Link Monitoring Test for In-sync	SNRs as specified Time durations as specified	0.6dB 0.28s, T2 only	Same as 7.3.62

without DRX for UE Category NB1 In-Band mode in Enhanced Coverage			
7.3.66 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 Standalone mode in Normal Coverage	SNRs as specified	0.6dB	Same as 7.3.60
7.3.67 HD-FDD Radio Link Monitoring Test for Out-of-sync without DRX for UE Category NB1 guard band mode in Enhanced Coverage	SNRs as specified	0.6dB	Same as 7.3.60
7.3.69 E-UTRAN HD-FDD Early Out-of-sync reporting Test for CE UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.52 The Test Tolerance values are taken from the analysis for similar HD-FDD Test case 7.3.52 and no separate analysis is needed.
7.3.88 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Same as 7.3.60	Same as 7.3.60	Same as 7.3.60
7.3.89 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	Same as 7.3.61	Same as 7.3.61	Same as 7.3.61
7.4.1 E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC	SNRs as specified	0.6dB	Formula: SNR + TT
7.4.2 E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC	SNRs as specified	0.6dB	Same as 7.4.1
7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity	SNRs as specified	0.6dB	Same as 7.4.1
7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	Uplink timing: ±12T_s $\hat{E}s$ / N_{oc}: +3.00dB	±3T_s +0.3dB	Uplink timing: ±15T_s $\hat{E}s$ / N_{oc}: +3.30dB
7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	Uplink timing: ±12T_s $\hat{E}s$ / N_{oc}: +3.00dB	±3T_s +0.3dB	Uplink timing: ±15T_s $\hat{E}s$ / N_{oc}: +3.30dB
7.6.1 E-UTRAN FDD-TDD CA interruption at SRS carrier based switching	SNRs as specified	0dB	Formula: SNR + TT
7.6.2 E-UTRAN TDD-TDD CA interruption at SRS carrier based switching	SNRs as specified	0dB	Same as 7.6.1
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB	During T1: 0dB 2.10dB 0dB During T2: 0dB 2.10dB 2.10dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.10dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.10dB $\hat{E}s_2$ / N_{oc}: +6.10dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1

propagation conditions in synchronous cells			
8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB
8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.1.5	Same as 8.1.5	Same as 8.1.5
8.1.7 UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +1.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +1.00dB $\hat{E}s_2$ / N_{oc}: -4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0.8dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +1.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +1.00dB $\hat{E}s_2$ / N_{oc}: -3.20dB
8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	During T1: Noc: -98dBm/15kHz Ês1 / Noc: +4.00dB Ês2 / Noc: +2.00dB Ês3 / Noc: -infinity During T2: Noc: -98dBm/15kHz Ês1 / Noc: +4.00dB Ês2 / Noc: +2.00dB Ês3 / Noc: -4.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.8dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +2.00dB $\hat{E}s_3$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_1$ / N_{oc}: +2.00dB $\hat{E}s_2$ / N_{oc}: -3.20dB
8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth	Same as 8.1.3	Same as 8.1.3	Same as 8.1.3
8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	During T1: 0dB 2.10dB 0dB During T2: 0dB 2.10dB 2.10dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.10dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.10dB $\hat{E}_{s2}$ / N_{oc}: +6.10dB
8.1.11_2 E-UTRAN FDD-FDD intra-frequency event triggered	During T1: N_{oc}: -98dBm/15kHz	During T1: 0dB	During T1: N_{oc}: -98dBm/15kHz

reporting under fading propagation conditions in asynchronous cells for UE category 1bis	$\hat{E}_{s1}$ / N_{oc}: +7.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +7.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	0.9dB 0dB During T2: 0dB 0.9dB 2.40dB	$\hat{E}_{s1}$ / N_{oc}: +7.90dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +7.90dB $\hat{E}_{s2}$ / N_{oc}: +6.40dB
8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11	Same as 8.1.11
8.1.12_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.1.11_2	Same as 8.1.11_2	Same as 8.1.11_2
8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11	Same as 8.1.11
8.1.13_2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Same as 8.1.11_2	Same as 8.1.11_2	Same as 8.1.11_2
8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	During T1: 0dB 2.60dB 0dB During T2: 0dB 2.60dB 2.60dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.60dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.60dB $\hat{E}_{s2}$ / N_{oc}: +6.60dB
8.1.17_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.1.11_2	Same as 8.1.11_2	Same as 8.1.11_2
8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.17	Same as 8.1.17	Same as 8.1.17
8.1.18_2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 1bis	Same as 8.1.11_2	Same as 8.1.11_2	Same as 8.1.11_2
8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB

	During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: +8.00dB $\hat{E}_{s2}$ / N_{oc}: +11.00dB	During T3: 0dB 0dB 0dB	During T3: N_{oc}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc}: +8.00dB $\hat{E}_{s2}$ / N_{oc}: +11.00dB
8.1.19_2 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.20_2 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis	Same as 8.1.20	Same as 8.1.20	Same as 8.1.20
8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0.2dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.20dB
8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.26 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.27 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.28 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23

8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.31 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.1.32 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.00dB $\hat{E}_{s2}$ / N_{oc}: -12.00dB	During T1: 0dB 0.8dB 0dB During T2: 0dB 1.2dB 1.2dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -11.20dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -10.80dB $\hat{E}_{s2}$ / N_{oc}: -10.80dB
8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.1.40 E-UTRAN FDD-FDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4dB $\hat{E}s_2$ / N_{oc}: +4dB	During T1: 0dB 0.7dB 0dB During T2: 0dB 0.7dB 0.7dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.7dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.7dB $\hat{E}s_2$ / N_{oc}: +4.7dB
8.1.41 E-UTRAN FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap	During T1: N_{oc}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc}: +19dB During T2: N_{oc}: -104dBm/15kHz $\hat{E}s$ / N_{oc}: -3dB	During T1: 0dB 0.6dB During T2: 0dB 0dB	During T1: N_{oc}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc}: +19.6dB During T2: N_{oc}: -104dBm/15kHz $\hat{E}s$ / N_{oc}: -3dB
8.1.42 E-UTRAN HD-FDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE UE in CEModeA without gap	Same as 8.1.41	Same as 8.1.41	Same as 8.1.41
8.2.1 E-UTRAN TDD-TDD intra frequency event triggered	During T1: N_{oc}: -98dBm/15kHz	During T1: 0dB	During T1: N_{oc}: -98dBm/15kHz

reporting under fading propagation conditions in synchronous cells	$\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: +4.00dB	2.10dB 0dB During T2: 0dB 2.60dB 2.60dB	$\hat{E}s_1 / N_{oc}$: +6.10dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.60dB $\hat{E}s_2 / N_{oc}$: +6.60dB
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.2.1	Same as 8.2.1	Same as 8.2.1
8.2.3 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB
8.2.4 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.2.3	Same as 8.2.3	Same as 8.2.3
8.2.5 UE Measurement Procedures / E-UTRAN TDD-TDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Same as 8.1.7	Same as 8.1.7	Same as 8.1.7
8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 8.1.8	Same as 8.1.8	Same as 8.1.8
8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.2.7_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 1bis	Same as 8.2.7	Same as 8.2.7	Same as 8.2.7
8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.2.8_2 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 1bis	Same as 8.2.8	Same as 8.2.8	Same as 8.2.8
8.2.11 E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: -infinity	During T1: 0dB 0.9dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.90dB $\hat{E}s_2 / N_{oc}$: -infinity

in synchronous cells	During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB	During T2: 0dB 0.9dB 0.9dB	During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.90dB $\hat{E}s_2$ / N_{oc}: +4.90dB
8.2.14 E-UTRAN TDD intra-frequency event triggered reporting for serving cell under fading propagation conditions for CE in CEModeA without gap	Same as 8.1.41	Same as 8.1.41	Same as 8.1.41
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.7dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.70dB
8.3.1_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 1bis	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 1.7dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +8.70dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1
8.3.2_2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells for UE category 1bis	Same as 8.3.1_2	Same as 8.3.1_2	Same as 8.3.1_2
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +24.00dB	During T1: +2.5dB 0dB 0dB 0dB During T2: +2.5dB -4.0dB 0dB 0dB	During T1: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB During T2: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +0.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +24.00dB
8.3.3_2 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used for UE category 1bis	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +24.00dB	During T1: +2.5dB 0dB 0dB 0dB During T2: +2.5dB -4.0dB 0dB +1dB	During T1: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB During T2: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +0.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +25.00dB
8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB	During T1: 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB

autonomous gaps	N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB	0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB
8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.3.4	Same as 8.3.4	Same as 8.3.4
8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB
8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -infinity N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: +7.00dB N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: +7.00dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -infinity N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +7.00dB N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: +7.00dB N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: +7.00dB
8.3.8 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.3.7	Same as 8.3.7	Same as 8.3.7
8.3.9 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -infinity N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 1dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -infinity N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +5.00dB

	N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: +4.00dB N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: +4.00dB	0dB 1dB 0dB 1dB	N_{oc3}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc3}: +5.00dB N_{oc4}: -98dBm/15kHz $\hat{E}s_4$ / N_{oc4}: +5.00dB
8.3.12 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +4.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 4.65dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +8.65dB
8.3.13 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	Same as 8.3.12	Same as 8.3.12	Same as 8.3.12
8.3.14 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -12.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -12.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -12.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 4.65dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -12.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -12.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -8.35dB
8.3.15 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Same as 8.3.14	Same as 8.3.14	Same as 8.3.14
8.3.16 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.3.12	Same as 8.3.12	Same as 8.3.12
8.3.17 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.3.12	Same as 8.3.12	Same as 8.3.12
8.3.18 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.3.14	Same as 8.3.14	Same as 8.3.14
8.3.19 E-UTRAN HD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.3.14	Same as 8.3.14	Same as 8.3.14
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz	During T1: 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz

synchronous cells	$\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB	0dB During T2: 0dB 0dB 0dB 0.7dB	$\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.70dB
8.4.1_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 1bis	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 1.7dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +8.70dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.4.2_2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells for UE category 1bis	Same as 8.4.1_2	Same as 8.4.1_2	Same as 8.4.1_2
8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Same as 8.3.3	Same as 8.3.3	Same as 8.3.3
8.4.3_2 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used for UE category 1bis	Same as 8.3.3_2	Same as 8.3.3_2	Same as 8.3.3_2
8.4.4 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}_{s1}$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: +7.00dB
8.4.5 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4
8.4.6 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.4.6_2 E-UTRAN TDD-TDD	Same as 8.4.1_2	Same as 8.4.1_2	Same as 8.4.1_2

Inter-frequency event triggered reporting for TDD UL/DL configuration 0 for UE category 1bis			
8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group	Same as 8.3.7	Same as 8.3.7	Same as 8.3.7
8.4.8 TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.3.8 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.8 and no separate analysis is needed.	Same as 8.3.9 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.8 and no separate analysis is needed.	Same as 8.3.8 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.8 and no separate analysis is needed.
8.4.9 TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX	Same as 8.3.9 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.9 and no separate analysis is needed.	Same as 8.3.9 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.9 and no separate analysis is needed.	Same as 8.3.9 The Test Tolerance values are taken from the analysis for similar FDD-FDD Test case 8.3.9 and no separate analysis is needed.
8.4.12 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeA	Same as 8.3.12 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.12 and no separate analysis is needed.	Same as 8.3.12 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.12 and no separate analysis is needed.	Same as 8.3.12 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.12 and no separate analysis is needed.
8.4.13 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE with discontinuous MPDCCH monitoring in CEModeB	Same as 8.3.13 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.13 and no separate analysis is needed.	Same as 8.3.12 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.13 and no separate analysis is needed.	Same as 8.3.12 The Test Tolerance values are taken from the analysis for similar FDD Test case 8.3.13 and no separate analysis is needed.
8.4.14 TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeA when DRX is used	Same as 8.4.12	Same as 8.4.12	Same as 8.4.12
8.4.15 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for CE UE in CEModeB when DRX is used	Same as 8.4.13	Same as 8.4.13	Same as 8.4.13
8.5.1 E-UTRAN FDD – UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz	During T1: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz

	Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	 During T2: 0dB 0dB 0dB 0dB	Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
8.5.2 E-UTRAN FDD – UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -3.35 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.4dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -2.95dB
8.5.3 E-UTRAN FDD – UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1
8.5.4 E-UTRAN FDD – UTRAN FDD enhanced cell identification under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02dB
8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1
8.5.8 E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB	During T1: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB

	UTRA Cells 2, 3 and 4 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity <u>During T2:</u> E-UTRA Cell 1: Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cells 2, 3 and 4 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	 <u>During T2:</u> 0dB 0dB 0dB 0dB	UTRA Cells 2, 3 and 4 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity <u>During T2:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cells 2, 3 and 4 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB
8.6.1 E-UTRAN TDD -UTRAN FDD event triggered reporting under fading propagation conditions	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1
8.6.3 E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.5.8	Same as 8.5.8	Same as 8.5.8
8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB <u>During T2:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB 0dB <u>During T2:</u> 0dB 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB <u>During T2:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB <u>During T2:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	<u>During T1:</u> 0dB 0dB -0.40dB 0dB 0dB 0dB <u>During T2:</u> 0dB 0dB -0.40dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80.40dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB <u>During T2:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80.40dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB

	DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: - infinity PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: +8dB PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB +0.6dB 0dB 0dB 0dB During T2: 0dB 0dB +0.6dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -79.4dBm/1.28MHz Ior / Ioc: - infinity PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -79.4dBm/1.28MHz Ior / Ioc: +8dB PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB
8.7.5 E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cells 2, 3 and 4 I_{oc}: -70dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -inf DwPCH_Ec/Ior: -inf During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cells 2,3 and 4 I_{oc}: -70dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cells 2, 3 and 4 I_{oc}: -70dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -inf DwPCH_Ec/Ior: -inf During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cells 2,3 and 4 I_{oc}: -70dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7A.1 E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX	Same as 8.7.5	Same as 8.7.5	Same as 8.7.5
8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
8.8.2 E-UTRAN FDD- GSM	During T1:	During T1:	During T1:

event triggered reporting when DRX is used in AWGN	E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -75dBm	 0dB 0dB 0dB During T2: 0dB 0dB 0dB	E-UTRAN Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -75dBm
8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: 9 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0 dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: 9 dB
8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Same as 8.7.4	Same as 8.7.4	Same as 8.7.4
8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN	Same as 8.8.1	Same as 8.8.1	Same as 8.8.1
8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.2	Same as 8.8.2	Same as 8.8.2
8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 3dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 3dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.6dB 0dB +0.6dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 3.6dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 3.6dB
8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Same as 8.11.1	Same as 8.11.1	Same as 8.11.1
8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2	During T1: 0dB -1.05dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2

	Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	0dB 0dB 0dB 0dB During T2: 0dB -1.05dB 0dB 0dB 0dB 0dB	Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB
8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 9.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB -1.05dB 0dB 0dB -0.4dB 0dB 0dB 0dB During T2: 0dB -1.05dB 0dB 0dB -0.4dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 I_{oc}: -80.4dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 I_{oc}: -80.4dBm/1.28MHz I_{or} / I_{oc}: 9.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity GSM Cell 3 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB GSM Cell 3 Signal level: -75dBm	During T1: 0dB -0.2dB 0dB 0dB 0dB During T2: 0dB -0.2dB 0dB +0.5dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +3.80dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity GSM Cell 3 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +3.80dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.50dB GSM Cell 3 Signal level: -75dBm
8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Same as 8.11.5	Same as 8.11.5	Same as 8.11.5
8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1

propagation conditions in asynchronous cells			
8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1
8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4
8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4
8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB -0.2dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2:	During T1: 0dB 0dB 0dB 0dB 0dB During T2:	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2:

	E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB	 0dB 0dB 0dB 0dB 0dB	E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB
8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB <u>During T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	<u>During T1:</u> 0dB +0.2dB -0.1dB +0.3dB 0dB <u>During T2:</u> 0dB +0.2dB -0.1dB +0.3dB 0dB <u>During T3:</u> 0dB 0dB -0.1dB -0.1dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB <u>During T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.1dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Same as 8.16.5	Same as 8.16.5	Same as 8.16.5
8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB <u>During T2:</u> 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB
8.16.8 E-UTRAN TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20	Same as 8.16.7	Same as 8.16.7	Same as 8.16.7

MHz bandwidth			
8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.9	Same as 8.16.9	Same as 8.16.9
8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.12 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB

	E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	 0dB 0dB 0dB	E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.13	Same as 8.16.13	Same as 8.16.13
8.16.15 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.16 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Same as 8.16.37	Same as 8.16.37	Same as 8.16.37
8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.18A E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.23 E-UTRAN TDD-FDD CA	During T1:	During T1:	During T1:

Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	 0dB +0.2dB -0.5dB +0.7dB 0dB During T2: 0dB +0.2dB -0.5dB +0.7dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17.2dB E-UTRA Cell 2 N_{oc2}: -104.5dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.7dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17.2dB E-UTRA Cell 2 N_{oc2}: -104.5dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.7dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 17.0dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Same as 8.16.23	Same as 8.16.23	Same as 8.16.23
8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB	During T1: 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB
8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Same as 8.16.25	Same as 8.16.25	Same as 8.16.25
8.16.27 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity	During T1: 0dB 0dB 0dB 0dB -0.5dB +0.7dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity

	During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -3dB	During T2: 0dB 0dB 0dB +0.2dB -0.5dB +0.7dB 0dB During T3: 0dB 0dB 0dB -0.2dB -0.5dB -0.7dB -0.7dB	During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.2dB E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.2dB E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -3.7dB
8.16.28 E-UTRAN TDD-FDD 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.29 3DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.30 3DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T3: 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16 E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2

	N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}:16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity During T4: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 16dB	0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 16dB
8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB	During T1,T2,T3: 0dB 0dB 0dB 0dB 0dB 0dB	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB
8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.37 3DL FDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.38 3DL TDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB During T2, T3:	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2, T3:	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB During T2, T3:

	E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB	 0dB 0dB 0dB 0dB 0dB 0dB	E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB
8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.47 2DL/2UL FDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.48 2DL/2UL TDD CA activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.49 2DL/2UL TDD-FDD CA (FDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.50 2DL/2UL TDD-FDD CA (TDD PCell) activation and deactivation of known PUCCH SCell without valid TA in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.51 E-UTRAN 4 DL FDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 17dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB +0.2dB -0.5dB +0.7dB 0dB <u>During T2:</u> 0dB 0dB 0dB +0.2dB 0dB +0.2dB -0.5dB +0.7dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.2dB E-UTRA Cell 4 N_{oc4}: -104.5dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17.7dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.2dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.2dB E-UTRA Cell 4 N_{oc4}: -104.5dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17.7dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 17dB

	During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -3dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -3dB	During T3: 0dB 0dB 0dB -0.2dB 0dB -0.2dB -0.5dB -0.7dB -0.7dB	During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.2dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3.2dB E-UTRA Cell 4 N_{oc4}: -104.5dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -3.7dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -3.7dB
8.16.52 E-UTRAN 4 DL TDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51	
8.16.53 4 DL PCell in FDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51	
8.16.54 4 DL PCell in TDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	Same as 8.16.51	Same as 8.16.51	
8.16.55 4DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16 E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz

	$\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}:16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}:16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity <u>During T4:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 16dB	 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	$\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: -infinity E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 16dB E-UTRA Cell 5 $\hat{E}s_5$ / N_{oc4}: 16dB
8.16.56 4DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.55	Same as 8.16.55	Same as 8.16.55
8.16.57 4DL FDD CA Activation and Deactivation of Known SCell in Non-DRX	<u>During T1, T2, T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB	<u>During T1,T2,T3:</u> 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	<u>During T1, T2, T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB
8.16.58 4DL TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.59 4DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.60 4DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.61 4DL FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB

	During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB	During T2, T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB
8.16.62 4DL TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.16.63 4DL PCell in FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.16.64 4DL PCell in TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.16.65 5 DL PCell in FDD CA Event Triggered Reporting with 4 Deactivated SCells in Non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3	During T1: 0dB 0dB 0dB 0dB 0dB +0.2dB 0dB +0.2dB -0.5dB +0.7dB 0dB During T2: 0dB 0dB 0dB +0.2dB 0dB +0.2dB 0dB +0.2dB -0.5dB +0.7dB 0dB During T3: 0dB 0dB 0dB -0.2dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.2dB E-UTRA Cell 4 N_{oc4}: -104.5dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17.7dB E-UTRA Cell 5 N_{oc5}: -104.5dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17.7dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.2dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.2dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17.2dB E-UTRA Cell 5 N_{oc5}: -104.5dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17.7dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.2dB E-UTRA Cell 3

	N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -3dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: -3dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: -3dB	0dB -0.2dB 0dB -0.2dB -0.5dB -0.7dB -0.7dB	N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3.2dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: -3.2dB E-UTRA Cell 5 N_{oc5}: -104.5dBm/15kHz $\hat{E}s_5$ / N_{oc5}: -3.7dB E-UTRA Cell 6 $\hat{E}s_6$ / N_{oc5}: -3.7dB
8.16.66 5 DL PCell in TDD CA Event Triggered Reporting with 4 Deactivated SCells in Non-DRX	Same as 8.16.65	Same as 8.16.65	Same as 8.16.65
8.16.67 5DL Pcell in FDD CA activation and deactivation of unknown SCell in non-DRX	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB <u>During T2, T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB <u>During T2, T3:</u> 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB <u>During T2, T3:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}s_5$ / N_{oc5}: 17dB
8.16.68 5DL Pcell in TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67	Same as 8.16.67
8.16.69 5DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67	Same as 8.16.67
8.16.70 5DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.67	Same as 8.16.67	Same as 8.16.67
8.16.71 5 DL FDD CA Event Triggered Reporting with Deactivated SCells in Non-DRX	Same as 8.16.65	Same as 8.16.65	Same as 8.16.65
8.16.72 5 DL TDD CA Event Triggered Reporting with Deactivated SCells in Non-DRX	Same as 8.16.65	Same as 8.16.65	Same as 8.16.65
8.16.73 5DL FDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	<u>During T1, T2, T3 and T4:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz	<u>During T1, T2, T3 and T4:</u> 0dB 0dB 0dB	<u>During T1, T2, T3 and T4:</u> E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz

	$\hat{E}_{s2}$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: 16dB E-UTRA Cell 5 N_{oc5}: -101dBm/15kHz $\hat{E}_{s5}$ / N_{oc5}: 16dB During T1 and T3: E-UTRA Cell 6 $\hat{E}_{s6}$ / N_{oc5}: -infinity During T2 and T4: E-UTRA Cell 6 $\hat{E}_{s6}$ / N_{oc5}: 16dB	0dB 0dB 0dB 0dB 0dB 0dB 0dB During T1 and T3: 0dB During T2 and T2: 0dB	$\hat{E}_{s2}$ / N_{oc2}: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: 16dB E-UTRA Cell 4 N_{oc4}: -101dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: 16dB E-UTRA Cell 5 N_{oc5}: -101dBm/15kHz $\hat{E}_{s5}$ / N_{oc5}: 16dB During T1 and T3: E-UTRA Cell 6 $\hat{E}_{s6}$ / N_{oc5}: -infinity During T2 and T4: E-UTRA Cell 6 $\hat{E}_{s6}$ / N_{oc5}: 16dB
8.16.74 5DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.73	Same as 8.16.73	Same as 8.16.73
8.16.75 5DL PCell in FDD CA activation and deactivation of known SCell in non-DRX	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}_{s5}$ / N_{oc5}: 17dB	During T1,T2,T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1}$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}_{s2}$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}_{s3}$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}_{s4}$ / N_{oc4}: 17dB E-UTRA Cell 5 N_{oc5}: -104dBm/15kHz $\hat{E}_{s5}$ / N_{oc5}: 17dB
8.16.76 5DL PCell in TDD CA activation and deactivation of known SCell in non-DRX	Same as 8.16.75	Same as 8.16.75	Same as 8.16.75
8.16.77 5DL FDD CA activation and deactivation of known SCell in non-DRX	Same as 8.16.75	Same as 8.16.75	Same as 8.16.75
8.16.78 E-UTRAN TDD 5DL CA activation and deactivation of known SCell in non-DRX	Same as 8.16.75	Same as 8.16.75	Same as 8.16.75
8.16.83 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.27, and no separate analysis is needed.
8.16.84 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.31, and no separate analysis is needed.
8.16.85 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.35, and no separate analysis is

			needed.
8.16.86 3 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.39, and no separate analysis is needed.
8.16.87 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.51	Same as 8.16.51	Same as 8.16.51
8.16.88 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.55	Same as 8.16.55	Same as 8.16.55
8.16.91 5 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	Same as 8.16.65	Same as 8.16.65	Same as 8.16.65
8.16.92 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	Same as 8.16.73	Same as 8.16.73	Same as 8.16.73
8.16.89 4 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.35, and no separate analysis is needed.
8.16.90 4 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.39, and no separate analysis is needed.
8.16.93 5 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	Same as 8.16.75	Same as 8.16.75	Same as 8.16.75 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.35, and no separate analysis is needed.
8.16.94 5 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	Same as 8.16.67	Same as 8.16.67	Same as 8.16.67 The Test Tolerance values are taken from the analysis for the related 3DL Test case 8.16.39, and no separate analysis is needed.
8.20.1 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz

	Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 7dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB	0dB 0dB 0.7dB 0dB 0dB	Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 7.7dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB
8.20.2 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1
8.20.2A UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1
8.20.2B UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1
8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB
8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2:	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2:	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2:

	E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 5.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 5.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Same as 8.20.4	Same as 8.20.4	Same as 8.20.4
8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	Same as 8.20.4	Same as 8.20.4	Same as 8.20.4
8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.00dB
8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.22.3	Same as 8.22.3	Same as 8.22.3
8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	During T1: N_{oc}: -98dBm/15kHz CRS $\hat{E}s_1$ / N_{oc}: +4.00dB CRS $\hat{E}s_2$ / N_{oc}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB CSI-RS $\hat{E}s_1$ / N_{oc}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc}: +10.00dB	During T1: 0dB 2.10dB 0dB 2.10dB 2.10dB During T2: 0dB 2.10dB 2.10dB 2.10dB 2.10dB	During T1: N_{oc}: -98dBm/15kHz CRS $\hat{E}s_1$ / N_{oc}: +6.10dB CRS $\hat{E}s_2$ / N_{oc}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc}: +12.10dB CSI-RS $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.10dB $\hat{E}s_2$ / N_{oc}: +6.10dB CSI-RS $\hat{E}s_1$ / N_{oc}: +12.10dB CSI-RS $\hat{E}s_2$ / N_{oc}: +12.10dB
8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc}: -infinity	During T1: 0dB 2.60dB 0dB 2.60dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.60dB $\hat{E}s_2$ / N_{oc}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc}: +12.60dB CSI-RS $\hat{E}s_2$ / N_{oc}: -infinity

	During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB CSI-RS $\hat{E}s_1$ / N_{oc}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc}: +10.00dB	During T2: 0dB 2.60dB 2.60dB 2.60dB 2.60dB	During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.60dB $\hat{E}s_2$ / N_{oc}: +6.60dB CSI-RS $\hat{E}s_1$ / N_{oc}: +12.60dB CSI-RS $\hat{E}s_2$ / N_{oc}: +12.60dB
8.22.7 E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	During T1: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHzCRS $\hat{E}s_1$ / N_{oc1}: +4.00dB CRS $\hat{E}s_2$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB $\hat{E}s_2$ / N_{oc2}: +7.00dB CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +13.00dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.2dB 0dB 0.2dB	During T1: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHzCRS $\hat{E}s_1$ / N_{oc1}: +4dB CRS $\hat{E}s_2$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB $\hat{E}s_2$ / N_{oc2}: +7.2dB CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +13.20dB
8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	During T1: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHzCRS $\hat{E}s_1$ / N_{oc1}: +4.00dB CRS $\hat{E}s_2$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4.00dB $\hat{E}s_2$ / N_{oc2}: +7.00dB CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +13.00dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHzCRS $\hat{E}s_1$ / N_{oc1}: +4dB CRS $\hat{E}s_2$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz N_{oc2}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +4dB $\hat{E}s_2$ / N_{oc2}: +7.2dB CSI-RS $\hat{E}s_1$ / N_{oc1}: +10.00dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +13.20dB
8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: -3dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: -3dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 3dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: 17dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 23dB E-UTRA Cell 2	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: -3dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: -3dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 3dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: 17dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 23dB E-UTRA Cell 2

	N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 23dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_3$ / N_{oc2}: -infinity During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: 17dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 23dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 23dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_3$ / N_{oc2}: 23dB	0dB 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 23dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: -infinity CSI-RS $\hat{E}s_3$ / N_{oc2}: -infinity During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz CRS $\hat{E}s_1$ / N_{oc1}: 17dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 23dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz CRS $\hat{E}s_2$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 23dB E-UTRA Cell 3 CRS $\hat{E}s_3$ / N_{oc2}: 17dB CSI-RS $\hat{E}s_3$ / N_{oc2}: 23dB
8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Same as 8.22.11	Same as 8.22.11	Same as 8.22.11
8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	During T1: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 16dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 16dB During T2: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: -2.5dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 2.5dB During T3: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 20dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 20dB	During T1: 0dB 0.2dB 0dB 0.2dB During T2: 0dB -0.2dB 0dB -0.2dB During T3: 0dB 0.2dB 0dB 0.2dB	During T1: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 16.2dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 16.2dB During T2: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: -2.7dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: -2.7dB During T3: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 20.2dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 20.2dB
8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.1	Same as 8.23.1	Same as 8.23.1
8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.1	Same as 8.23.1	Same as 8.23.1
8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	During T1: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2:	During T1: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1

	Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: 7dB	0dB 0dB 0dB 0dB 0dB 0dB	Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: 7dB
8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.4	Same as 8.23.4	Same as 8.23.4
8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.4	Same as 8.23.4	Same as 8.23.4
8.26.1 E-UTRAN FDD-FS3 Activation and deactivation of known FS3 SCell with FDD PCell in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB
8.26.2 E-UTRAN TDD-FS3 Activation and deactivation of known FS3 SCell with TDD PCell in non-DRX	Same as 8.26.1	Same as 8.26.1	Same as 8.26.1
8.26.3 E-UTRAN FDD-FS3 Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 13dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 13dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 13dB	During T1: 0dB 0dB 0dB -3.1dB 0dB During T2: 0dB 0dB 0dB -3.1dB -3.1dB	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 9.9dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 9.9dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 9.9dB
8.26.3A E-UTRAN FDD-FS3 3-DL Event triggered reporting on deactivated FS3 SCell and FDD PCell interruption in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 13dB E-UTRA Cell 3 N_{oc2}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc2}: 13dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc2}: -infinity During T2:	During T1: 0dB 0dB 0dB -3.1dB 0dB -3.1dB 0dB During T2:	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 9.9dB E-UTRA Cell 3 N_{oc2}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc2}: 9.9dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc2}: -infinity During T2:

	E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 13dB E-UTRA Cell 3 N_{oc2}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc2}: 13dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc2}: 13dB	0dB 0dB 0dB -3.1dB 0dB -3.1dB -3.1dB	E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 13dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 9.9dB E-UTRA Cell 3 N_{oc2}: -98dBm/15kHz $\hat{E}s_3$ / N_{oc2}: 9.9dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc2}: 9.9dB
8.26.4 E-UTRAN TDD-FS3 Event triggered reporting on deactivated FS3 SCell and TDD PCell interruption in non-DRX	Same as 8.26.3	Same as 8.26.3	Same as 8.26.3
8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 4dB	<u>During T1:</u> 0dB 0dB 0dB 0dB 0dB <u>During T2:</u> 0dB 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 4dB
8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	Same as 8.26.5	Same as 8.26.5	Same as 8.26.5
8.26.7 E-UTRAN FDD-FS3 intra-frequency event triggered reporting in DRX for CRS based discovery signal	Same as 8.26.5	Same as 8.26.5	Same as 8.26.5
8.26.8 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal	Same as 8.26.5	Same as 8.26.5	Same as 8.26.5
8.26.9 E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity dB <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 7dB	<u>During T1:</u> 0dB 0dB 0dB 0dB <u>During T2:</u> 0dB 0dB 0dB 0dB	<u>During T1:</u> E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity dB <u>During T2:</u> E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 7dB
8.26.10 E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading	Same as 8.26.9	Same as 8.26.9	Same as 8.26.9

propagation conditions in synchronous cells			
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±6dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_43 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_45 to RSRP_64 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_17 to RSRP_32 RSRP_18 to RSRP_33 RSRP_19 to RSRP_34 RSRP_20 to RSRP_35 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±4.5dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±4.5dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_42 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_45 to RSRP_64 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 RSRP_20 to RSRP_32 RSRP_21 to RSRP_33 RSRP_22 to RSRP_34 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.1.1_2 FDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±5.5dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±9dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_28 to RSRP_43 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_44 to RSRP_65

	Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±5.5dB	Test 3: 0dB 0dB +0.8dB Via mapping	Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_17 to RSRP_31 RSRP_18 to RSRP_32 RSRP_19 to RSRP_33 RSRP_20 to RSRP_34 RSRP_21 to RSRP_35 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.1.1_3 FDD Intra Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements	Test 1: N_{oc}: -96dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRP values: ±9.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRP values: ±6dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -97.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +4.0dB RSRP_42 to RSRP_54 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +4.0dB RSRP_48 to RSRP_67 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +3.8dB RSRP_23 to RSRP_35 RSRP_24 to RSRP_36 RSRP_24 to RSRP_36 RSRP_25 to RSRP_37 RSRP_25 to RSRP_37 RSRP_26 to RSRP_38 RSRP_27 to RSRP_39 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.1.2 FDD Intra Frequency Relative RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB	Test 1: N_{oc}: -106 dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_x-9 to RSRP_x+1 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: 0dB RSRP_x-8 to RSRP_x+2

		Via mapping	
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.1.2_2 FDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±4dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -106 dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-10 to RSRP_x+2 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: 0dB RSRP_x-8 to RSRP_x+2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1_1	Same as 9.1.1.1_1	Same as 9.1.1.1_1
9.1.2.1_2 TDD Intra Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.1.1_2	Same as 9.1.1.1_2	Same as 9.1.1.1_2
9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2	Same as 9.1.1.2
9.1.2.2_2 TDD Intra Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.1.2_2	Same as 9.1.1.2_2	Same as 9.1.1.2_2
9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB Reported RSRP values: ±8dB Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1 / N_{oc1}$: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2 / N_{oc2}$: -4.00dB Reported RSRP values: ±6dB	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -89.25dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB RSRP_52 to RSRP_71 Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1 / N_{oc1}$: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2 / N_{oc}$: -3.20dB RSRP_13 to RSRP_28 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.3.1_1 FDD Inter Frequency	Test 1:	Test 1:	Test 1:

Absolute RSRP Accuracy (Rel 12 and forward)	N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB Reported RSRP values: ±8dB <u>Test 2:</u> N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc2}: -4.00dB Reported RSRP values: ±6dB	-0.6dB 0dB -0.6dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB 0dB 0.8dB Via mapping	N_{oc1}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -89.25dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB RSRP_52 to RSRP_71 <u>Test 2:</u> N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc}: -3.20dB Normal condition: RSRP_14 to RSRP_26 RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 RSRP_18 to RSRP_30 Extreme condition: RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_13 to RSRP_34 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.3.1_2 FDD - FDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	<u>Test 1:</u> N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB Reported RSRP values: ±9dB <u>Test 2:</u> N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc2}: -4.00dB Reported RSRP values: ±5.5dB	<u>Test 1:</u> -0.6dB 0dB -0.6dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB 0dB 0.8dB Via mapping	<u>Test 1:</u> N_{oc1}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -89.25dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB RSRP_51 to RSRP_72 <u>Test 2:</u> N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc}: -3.20dB Normal condition: RSRP_13 to RSRP_27 RSRP_14 to RSRP_28 RSRP_15 to RSRP_29 RSRP_16 to RSRP_30 RSRP_17 to RSRP_31 Extreme condition: RSRP_9 to RSRP_32 RSRP_10 to RSRP_33 RSRP_11 to RSRP_34 RSRP_12 to RSRP_35 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.3.1_3 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Overlapping Carrier	Test 1: Noc1: -88.65dBm/15kHz Ês1 / Noc1: +10.00dB Noc2: -88.65dBm/15kHz Ês2 / Noc2: +10.00dB Reported RSRP values: ±9dB Test 2: Noc1: (Noc2 +8dB) Ês1 / Noc1: +13.00dB Noc2: -117dBm to -113.5dBm /15kHz depending on operating band Ês2 / Noc2: -4.00dB	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2: 0dB 0dB 0dB	Test 1: Noc1: -89.25dBm/15kHz Ês1 / Noc1: +10.00dB Noc2: -89.25dBm/15kHz Ês2 / Noc2: +10.00dB RSRP_51 to RSRP_72 Test 2: Noc1: (Noc2 +8dB) Ês1 / Noc1: +13.00dB Noc2: -117dBm to -113.5dBm /15kHz depending on operating band

	Reported RSRP values: ±5.5dB	0.8dB Via mapping	Ês2 / Noc: -3.20dB Normal condition: RSRP_13 to RSRP_27 RSRP_14 to RSRP_28 RSRP_15 to RSRP_29 RSRP_16 to RSRP_30 RSRP_17 to RSRP_31 Extreme condition: RSRP_9 to RSRP_32 RSRP_10 to RSRP_33 RSRP_11 to RSRP_34 RSRP_12 to RSRP_35 depending on operating band
9.1.3.1_4 FDD-FDD Inter Frequency Absolute RSRP Accuracy for CA Idle Mode Measurements for Non-Overlapping Carrier	Test 1: Noc1: -95Bm/15kHz Ês1 / Noc1: +10.00dB Noc2: -95dBm/15kHz Ês2 / Noc2: +10.00dB Reported RSRP values: ±10.5dB Test 2: Noc1: (Noc2 +8dB) Ês1 / Noc1: +13.00dB Noc2: -117dBm to -113.5dBm /15kHz depending on operating band Ês2 / Noc2: -4.00dB Reported RSRP values: ±7dB	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: Noc1: -95.6dBm/15kHz Ês1 / Noc1: +10.00dB Noc2: -95.6dBm/15kHz Ês2 / Noc2: +10.00dB RSRP_45 to RSRP_66 Test 2: Noc1: (Noc2 +8dB) Ês1 / Noc1: +13.00dB Noc2: -117dBm to -113.5dBm /15kHz depending on operating band Ês2 / Noc: -3.20dB Normal condition: RSRP_14 to RSRP_28 RSRP_15 to RSRP_29 RSRP_15 to RSRP_29 RSRP_16 to RSRP_30 RSRP_16 to RSRP_30 RSRP_17 to RSRP_31 RSRP_18 to RSRP_32 depending on operating band
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values: ±6dB Test 2: N_{oc1}: (N_{oc2} +8dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values: ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: (N_{oc2} +7dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.3.2_1 FDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme : ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB Normal condition: RSRP_(x-7) to RSRP_(x+7) Extreme condition: RSRP_(x-9) to RSRP_(x+9)

	Test 2: N_{oc1}: (N_{oc2} +8dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme : ±6dB	Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 2: N_{oc1}: (N_{oc2} +7dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB Normal condition: RSRP_(x-30) to RSRP_(x-17) Extreme condition: RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.3.2_2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values normal: ±5.5dB Reported relative RSRP values extreme : ±7dB Test 2: N_{oc1}: (N_{oc2} +8dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values normal: ±5.5dB Reported relative RSRP values extreme : ±7dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB Normal condition: RSRP_(x-8) to RSRP_(x+8) Extreme condition: RSRP_(x-10) to RSRP_(x+10) Test 2: N_{oc1}: (N_{oc2} +7dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB Normal condition: RSRP_(x-31) to RSRP_(x-16) Extreme condition: RSRP_(x-33) to RSRP_(x-15)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_1 TDD Inter Frequency Absolute RSRP Accuracy (R12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_2 TDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.3.1_2	Same as 9.1.3.1_2	Same as 9.1.3.1_2
9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.2	Same as 9.1.3.2	Same as 9.1.3.2
9.1.4.2_1 TDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.2	Same as 9.1.3.2	Same as 9.1.3.2
9.1.4.2_2 TDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Same as 9.1.3.2_2	Same as 9.1.3.2_2	Same as 9.1.3.2_2
9.1.5.1 FDD-TDD inter frequency absolute RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported absolute RSRP values: ±8dB Test 2: N_{oc1}: -104dBm /15kHz	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2:	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_52 to RSRP_71 Test 2:

	N_{oc2}: -112dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported absolute RSRP values: ±6dB	0dB 0dB 0dB 0.8dB Via mapping	N_{oc1}: -104Bm /15kHz N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_18 to RSRP_33
9.1.5.1_1 FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Normal condition: Reported absolute RSRP values: ±8dB Extreme condition: Reported absolute RSRP values: ±11dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Normal condition: Reported absolute RSRP values: ±4.5dB Extreme condition: Reported absolute RSRP values: ±8dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_52 to RSRP_71 for normal condition RSRP_49 to RSRP_74 for extreme condition Test 2: N_{oc1}: -104Bm /15kHz N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_19 to RSRP_31 for normal condition RSRP_15 to RSRP_36 for extreme condition
9.1.5.1_2 FDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Same as 9.1.5.1_1		
9.1.5.1_2 FDD - TDD Inter Frequency Absolute RSRP Accuracy for UE category 1bis	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Normal condition: Reported absolute RSRP values: ±9dB Extreme condition: Reported absolute RSRP values: ±12dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Normal condition: Reported absolute RSRP values: ±5.5dB Extreme condition: Reported absolute RSRP values: ±10dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_51 to RSRP_72 for normal condition RSRP_48 to RSRP_75 for extreme condition Test 2: N_{oc1}: -104Bm /15kHz N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_18 to RSRP_32 for normal condition RSRP_14 to RSRP_37 for extreme condition
9.1.5.2 FDD-TDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported absolute RSRP values: ±6dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: -105.0Bm /15kHz

	$\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported absolute RSRP values: ±6dB	0dB 0dB 0.8dB Via mapping	N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.5.2_1 FDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel 12 and forward)	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme: ±6.0dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme: ±6.0dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB Normal condition: RSRP_(x-7) to RSRP_(x+7) Extreme condition: RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: -105.0Bm /15kHz N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB Normal condition: RSRP_(x-30) to RSRP_(x-17) Extreme condition: RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from Noc1 and Ês1 / Noc1 and Noc2 and Ês2 / Noc2, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.5.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRP for UE category 1bis	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values normal: ±5.5dB Reported relative RSRP values extreme: ±7.0dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values normal: ±5.5dB Reported relative RSRP values extreme: ±7.0dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB Normal condition: RSRP_(x-8) to RSRP_(x+8) Extreme condition: RSRP_(x-10) to RSRP_(x+10) Test 2: N_{oc1}: -105.0Bm /15kHz N_{oc2}: -112dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB Normal condition: RSRP_(x-31) to RSRP_(x-16) Extreme condition: RSRP_(x-33) to RSRP_(x-15)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from Noc1 and Ês1 / Noc1 and Noc2 and Ês2 / Noc2, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.6.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for	0dB 0dB 0dB 0dB 0dB Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Cell 1:

	extreme conditions	Via mapping	RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_13 to RSRP_29 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_21 to RSRP_37 RSRP_22 to RSRP_37 RSRP_23 to RSRP_38 RSRP_23 to RSRP_39 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.6.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Reported RSRP values: 4.5dB for normal conditions and 9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Normal condition Cell 1: RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 depending on operating band Cell 2: RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37 depending on Cell 1 band Exreme condition Cell 1: RSRP_9 to RSRP_30 RSRP_9 to RSRP_31 RSRP_10 to RSRP_31 RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_12 to RSRP_34 depending on operating band Cell 2: RSRP_17 to RSRP_38 RSRP_17 to RSRP_39 RSRP_18 to RSRP_39 RSRP_18 to RSRP_40 RSRP_19 to RSRP_40 RSRP_20 to RSRP_41 RSRP_20 to RSRP_42

			depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from Noc1 and Es1 / Noc1, the uncertainty in Cell 2 RSRP from Noc2 and Es2 / Noc2, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.6.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Reported relative RSRP values: (Cell 2 - Cell 1): ±4.5dB for normal conditions and ±6dB for extreme conditions (Cell 3 - Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -0.2dB Normal condition: (Cell 2 - Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1) Extreme condition: (Cell 2 - Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
9.1.7.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.7.1_1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1_1	Same as 9.1.6.1_1	Same as 9.1.6.1_1
9.1.7.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.7.2_1 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.2_1	Same as 9.1.6.2_1	Same as 9.1.6.2_1
9.1.8.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	<u>Test 1:</u> N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRP values: ±6dB <u>Test 2:</u> N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB	<u>Test 1:</u> 0dB 0dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB +0.95dB	<u>Test 1:</u> N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB RSRP_25 to RSRP_40 <u>Test 2:</u> N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB

	Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	RSRP_40 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.8.1_1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Test 1: Noc: -106.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -2.0dB Reported RSRP values: ±6dB Test 2: Noc: -88.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -4.0dB Reported RSRP values: ±8dB Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +5.0dB Ês2 / Noc: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: Noc: -106.0Bm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -2.0dB RSRP_26 to RSRP_39 Test 2: Noc: -88.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -3.05dB RSRP_40 to RSRP_59 Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +5.0dB Ês2 / Noc: -3.05dB RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from Noc and Ês2 / Noc, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.8.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported relative RSRP values: ±2dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB	Test 1: 0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRP_x-10 to RSRP_x-4 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_x-13 to RSRP_x-4 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_x-13 to RSRP_x-4
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP		

	from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For Test 1 extreme conditions allow 1dB wider at each end. Test 2, Test 3 RSRP values for extreme conditions are the same for normal conditions.		
9.1.9.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	Same as 9.1.8.1	Same as 9.1.8.1
9.1.9.1_1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel 12 and forward)	Test 1: Noc: -106.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -2.0dB Reported RSRP values: ±6dB Test 2: Noc: -88.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -4.0dB Reported RSRP values: ±8dB Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +5.0dB Ês2 / Noc: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: Noc: -106.0Bm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -2.0dB RSRP_26 to RSRP_39 Test 2: Noc: -88.0dBm/15kHz Ês1 / Noc: +5.0dB Ês2 / Noc: -3.05dB RSRP_40 to RSRP_59 Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +5.0dB Ês2 / Noc: -3.05dB RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from Noc and Ês2 / Noc, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.9.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.2	Same as 9.1.8.2	Same as 9.1.8.2
9.1.10.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB RSRP_25 to RSRP_40 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_40 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		

9.1.10.1_1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB RSRP_26 to RSRP_40 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_39 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from Noc and Ês2 / Noc, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions		
9.1.10.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported relative RSRP values: ±2dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported relative RSRP values: ±3dB	Test 1: 0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -1.2dB RSRP_x-10 to RSRP_x-4 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_x-13 to RSRP_x-4 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_x-13 to RSRP_x-4
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For Test 1 extreme conditions allow 1dB wider at each end. Test 2, Test 3 RSRP values for extreme conditions are the same for normal conditions.		
9.1.11.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.10.1	Same as 9.1.10.1	Same as 9.1.10.1
9.1.11.1_1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel 12 and forward)	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported RSRP values: ±6dB Test 2:	Test 1: 0dB 0dB 0dB Via mapping Test 2:	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB RSRP_26 to RSRP_40 Test 2:

	N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_39 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from Noc and Ês2 / Noc, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.11.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.10.2	Same as 9.1.10.2	Same as 9.1.10.2
9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.12.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.6.1_1	Same as 9.1.6.1_1	Same as 9.1.6.1_1
9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.12.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.6.2_1	Same as 9.1.6.2_1	Same as 9.1.6.2_1
9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.13.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.6.1_1	Same as 9.1.6.1_1	Same as 9.1.6.1_1
9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.13.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.2_1	Same as 9.1.12.2_1	Same as 9.1.12.2_1
9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported RSRP values: ±8dB Test 3:	Test 1: 0dB 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB +1.0dB Via mapping Test 3:	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB RSRP_25 to RSRP_41 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_40 to RSRP_59 Test 3:

	N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	0dB 0dB 0dB +1.0dB Via mapping	N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 RSRP_17 to RSRP_33 depending on operating band
9.1.14.1_1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel 12 and forward)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB Reported RSRP values: normal: ±4.5dB Reported RSRP values extreme: ±9dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported RSRP values normal: ±8dB Reported RSRP values extreme: ±11dB Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported RSRP values normal: ±4.5dB Reported RSRP values extreme: ±9dB	Test 1: 0dB 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB RSRP_27 to RSRP_39 RSRP_22 to RSRP_44 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_40 to RSRP_59 RSRP_37 to RSRP_62 Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_15 to RSRP_28 RSRP_16 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 RSRP_17 to RSRP_30 RSRP_18 to RSRP_31 RSRP_19 to RSRP_31 depending on operating band RSRP_11 to RSRP_32 RSRP_11 to RSRP_33 RSRP_12 to RSRP_33 RSRP_12 to RSRP_34 RSRP_13 to RSRP_34 RSRP_14 to RSRP_35 RSRP_14 to RSRP_36 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB Reported relative RSRP values: ±2dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB Test 3:	Test 1: 0dB 0dB 0dB +1dB Via mapping Test 2: 0dB 0dB 0dB +1dB Via mapping	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -0.5dB RSRP_x-8 to RSRP_x-2 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_x-12 to RSRP_x-3

	N_{oc}: -116 to -112.5 dBm/15kHz depending on frequency band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: -3.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB	Test 3: 0dB 0dB 0dB +1dB Via mapping	Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: -3.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_x-12 to RSRP_x-3
9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.1	Same as 9.1.14.1	Same as 9.1.14.1
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the uncertainty in Cell 3 RSRP from N_{oc} and $\hat{E}s_3$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For extreme conditions, the RSRP values are 3dB wider at each end in all cases.		
9.1.15.1_1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel 12 and forward)	Same as 9.1.14.1_1	Same as 9.1.14.1_1	Same as 9.1.14.1_1
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For extreme conditions,in test case 1 and 3 the RSRP values are 4.5 dB wider at each end , in test case 2 the RSRP values are 3 dB wider at each end		
9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.2	Same as 9.1.14.2	Same as 9.1.14.2
	The derivation of the RSRP values takes into account the uncertainty in Cell 3 RSRP from N_{oc} and $\hat{E}s_3$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For extreme conditions, the RSRP values are 1dB wider at each end for Test 1, the same than for normal conditions for Test 2, Test 3.		
9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -83dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -109.5dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported relative RSRP values: ±3dB	Test 1: -1.0dB 0 dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -104.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_31 to RSRP_46 Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_49 to RSRP_68 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_23 to RSRP_38
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		

9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel 12 and forward)	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±4.5dB Test 2: N_{oc}: -83dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -109.5dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±4.5dB	Test 1: -1.0dB 0 dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -104.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_32 to RSRP_45 Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_49 to RSRP_68 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_25 to RSRP_37
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -83dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -109.5.5dBm /15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -103 dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_x-9 to RSRP_x+1 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: 0dB RSRP_x-8 to RSRP_x+2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.17.1 FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -85.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -85.65dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB Reported RSRP values: ±8dB Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -110.5dBm /15kHz $\hat{E}s_2$ / N_{oc2}: -4.00dB Reported RSRP values: ±6dB	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -86.25dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -86.25dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB RSRP_55 to RSRP_74 Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -110.5dBm /15kHz $\hat{E}s_2$ / N_{oc}: -3.20dB RSRP_19 to RSRP_34
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Test 1: N_{oc1}: -85.65dBm/15kHz N_{oc2}: -85.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB	Test 1: -0.6dB -0.6dB 0dB 0dB	Test 1: N_{oc1}: -86.25dBm/15kHz N_{oc2}: -86.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB

	Reported relative RSRP values: ±6dB Test 2: N_{oc1}: -102.5dBm/15kHz N_{oc2}: -110.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values: ±6dB	Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: -103.5dBm/15kHz N_{oc2}: -100.5dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±4.5dB normal condition ±6dB normal condition (Cell 3 – Cell 2): ±3dB normal and extreme condition	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x+2) to RSRP_(x+15) RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.19.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.2	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for	Same as 9.1.18.2_1	Same as 9.1.18.2_1	Same as 9.1.18.2_1

10MHz + 5MHz (Rel-12 and forward)			
9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Cell 1: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_13 to RSRP_29 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_21 to RSRP_37 RSRP_22 to RSRP_37 RSRP_23 to RSRP_38 RSRP_23 to RSRP_39 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.20.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 5MHz + 5MHz	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Same as 9.1.20.1	Same as 9.1.20.1	Same as 9.1.20.1
9.1.21.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 5MHz + 5MHz	Same as 9.1.20.2	Same as 9.1.20.2	Same as 9.1.20.2
9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP	Same as 9.1.37 Cell 1, Cell 2 and Cell 3	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP
9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP	Same as 9.1.37 Cell 1, Cell 2 and Cell 3	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP

9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Cell 1: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_14 to RSRP_29 depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_22 to RSRP_37 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±4.5dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 1.5 dB wider at each end for extreme conditions.		
9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Cell 1: RSRP_13 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_28 depending on operating band Cell 2: RSRP_21 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_36 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. By using separate calculation for		

	normal and extreme condition, all cases the RSRP values are 4dB wider at each end for extreme conditions.		
9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values: ±3dB	Test 1: -1.0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_42 RSRP_25 to RSRP_46 RSRP_Cell 1 - 9 to RSRP_Cell 1 + 1
	The derivation of the RSRP values takes into account the uncertainty in Cell1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.25	Same as 9.1.25	Same as 9.1.25
	Same as 9.1.25		
9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Test 1: N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: 13dB $\hat{E}s_2$ / N_{oc2}: -6dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values:	Test 1: 0dB 0dB 0dB +0.8dB Via mapping Via mapping Via mapping	Test 1: N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: 13dB $\hat{E}s_2$ / N_{oc2}: -5.2dB Cell 2, absolute: RSRP_14 to RSRP_26 RSRP_15 to RSRP_27 RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 RSRP_18 to RSRP_30 depending on operating band Cell 2, absolute: RSRP_10 to RSRP_31 RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_13 to RSRP_34 RSRP_13 to RSRP_34 depending on operating band Relative: RSRP_(x-31) to RSRP_(x-18)

	Normal condtion: ±4.5dB Extreme condtion: ±6dB		RSRP_(x-33) to RSRP_(x-17)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.27	Same as 9.1.27	Same as 9.1.27
	Same as 9.1.27		
9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band CRS $\hat{E}s_1$ / N_{oc}: 3dB CSI-RS $\hat{E}s_1$ / N_{oc}: 9dB CRS $\hat{E}s_2$ / N_{oc}: -1dB CSI-RS $\hat{E}s_2$ / N_{oc}: 5dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative CSI-RSRP values: Normal condition: ±2dB Extreme condition: ±3dB	Test 1: 0 dB 0 dB 0 dB 0 dB +0.8 dB Via mapping	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band CRS $\hat{E}s_1$ / N_{oc}: 3dB CSI-RS $\hat{E}s_1$ / N_{oc}: 9dB CRS $\hat{E}s_2$ / N_{oc}: -1dB CSI-RS $\hat{E}s_2$ / N_{oc}: 5.8dB CSI-RSRP_24 to CSI-RSRP_43 CSI-RSRP_20 to CSI-RSRP_47 CSI-RSRP_Cell 1 – 7 to CSI-RSRP_Cell 1 – 1 CSI-RSRP_Cell 1 – 8 to CSI-RSRP_Cell 1 + 1
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-RSRP from N_{oc}, CSI-RS $\hat{E}s_1$ / N_{oc} and CSI-RS $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.29	Same as 9.1.29	Same as 9.1.29
9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band CSI-RS $\hat{E}s_1$ / N_{oc1}: 13dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 0dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±6dB	0dB 0dB 0dB +0.8dB Via mapping Via mapping Via mapping Via mapping	N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band CSI-RS $\hat{E}s_1$ / N_{oc1}: 13dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 0.8dB Cell 2: CSI_RSRP_20 to CSI_RSRP_32 CSI_RSRP_21 to CSI_RSRP_33 CSI_RSRP_21 to CSI_RSRP_33 CSI_RSRP_22 to CSI_RSRP_34 CSI_RSRP_22 to CSI_RSRP_34 CSI_RSRP_23 to CSI_RSRP_35 CSI_RSRP_24 to CSI_RSRP_36 CSI_RSRP_16 to CSI_RSRP_37 CSI_RSRP_16 to CSI_RSRP_37 CSI_RSRP_17 to CSI_RSRP_38 CSI_RSRP_17 to CSI_RSRP_38 CSI_RSRP_18 to CSI_RSRP_39 CSI_RSRP_19 to CSI_RSRP_40 CSI_RSRP_19 to CSI_RSRP_40 Cell 2 – Cell 1 CSI_RSRP_Cell 1 – 25 to CSI_RSRP_Cell 1 – 12 CSI_RSRP_Cell 1 – 27 to CSI_RSRP_Cell 1 – 11
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-		

	RSRP from N_{oc}, CSI-RS $\hat{E}s_1$ / N_{oc} and CSI-RS $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Test 1: N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: 3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values: (Cell 3 – Cell 2): ±3dB (Cell 3 – Cell 1): Normal condtion: ±4.5dB Extreme condtion: ±6dB	Test 1: 0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping Via mapping	Test 1: N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: 3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB Cell 3, absolute: RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 RSRP_19 to RSRP_31 RSRP_20 to RSRP_32 RSRP_20 to RSRP_32 RSRP_21 to RSRP_33 RSRP_22 to RSRP_34 depending on operating band Cell 3, absolute: RSRP_14 to RSRP_35 RSRP_14 to RSRP_35 RSRP_15 to RSRP_36 RSRP_15 to RSRP_36 RSRP_16 to RSRP_37 RSRP_17 to RSRP_38 RSRP_17 to RSRP_38 depending on operating band Relative: RSRP_(x-8) to RSRP_(x+1) RSRP_(x-2) to RSRP_(x+12) RSRP_(x-4) to RSRP_(x+13)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.1.33	Same as 9.1.33	Same as 9.1.33
	Same as 9.1.33		
9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc2} +1dB CSI-RS $\hat{E}s_1$ / N_{oc1}: 2dB CSI-RS $\hat{E}s_2$ / N_{oc2}: 9dB CSI-RS $\hat{E}s_3$ / N_{oc3}: 5dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported intra-freq relative CSI-RSRP values: Normal condtion: ±2dB Extreme condtion: ±3dB Reported inter-freq relative CSI-RSRP values: Normal condtion: ±4.5dB		

	Extreme condtion: ±6dB		
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-RSRP from N_{oc}, CSI-RS $\hat{E}s$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Same as 9.1.35		
9.1.37 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -1dB <u>Reported absolute RSRP values:</u> ±4.5dB for normal conditions and ±9dB for extreme conditions <u>Reported relative RSRP values:</u> (Cell 2 – Cell 1) and (Cell 4 – Cell 1): ±4.5dB for normal conditions ±6dB for extreme conditions (Cell 3 - Cell 2) and (Cell 5 - Cell 4): ±3dB	0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB Via mapping Via mapping Via mapping	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -0.2dB <u>Cell 1, absolute:</u> RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 depending on operating band <u>Cell 2 and Cell 4, absolute:</u> RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37 depending on Cell 1 band <u>Relative:</u> (Cell 2 – Cell 1) and (Cell 4 – Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2) and (Cell 5 - Cell 4): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.38 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37	Same as 9.1.37
9.1.39 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -1dB <u>Reported absolute RSRP values:</u>	0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -0.2dB

	±6dB for normal conditions and ±9dB for extreme conditions

	Test 2: Noc: -86dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +1.0dB Reported relative RSRP values: ±4dB Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: -1.0dB Reported relative RSRP values: ±4dB	Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 2: Noc: -87dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +2.0dB RSRP_x-10 to RSRP_x+2 Test 3: Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: 0dB RSRP_x-9 to RSRP_x+3
9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.41.1	Same as 9.1.41.1	Same as 9.1.41.1
9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.41.2	Same as 9.1.41.2	Same as 9.1.41.2
9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.41.1	Same as 9.1.41.1	Same as 9.1.41.1
9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.41.2	Same as 9.1.41.2	Same as 9.1.41.2
9.1.44 4 DL CA PCell in FDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB N_{oc4}: = N_{oc1} +1dB $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{oc2}: +3dB $Ês_3$ / N_{oc2}: -1dB $Ês_4$ / N_{oc3}: +3dB $Ês_5$ / N_{oc3}: -1dB $Ês_6$ / N_{oc4}: +3dB $Ês_7$ / N_{oc4}: -1dB Reported absolute RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB 0dB +0.8dB Via mapping	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB N_{oc4}: = N_{oc1} +1dB $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{oc2}: +3dB $Ês_3$ / N_{oc2}: -0.2dB $Ês_4$ / N_{oc3}: +3dB $Ês_5$ / N_{oc3}: -0.2dB $Ês_6$ / N_{oc4}: +3dB $Ês_7$ / N_{oc4}: -0.2dB Cell 1, absolute: RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 RSRP_20 to RSRP_32 depending on operating band Cell 2 and Cell 4, Cell 6, absolute: RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37 RSRP_28 to RSRP_40 depending on Cell 1 band

	Reported relative RSRP values: (Cell 2 – Cell 1) and (Cell 4 – Cell 1), (Cell 6 – Cell 1): ±4.5dB for normal conditions ±6dB for extreme conditions (Cell 3 - Cell 2) and (Cell 5 - Cell 4), (Cell 7 - Cell 6): ±3dB	Via mapping Via mapping	Relative: (Cell 2 – Cell 1) and (Cell 4 – Cell 1),(Cell 6 –Cell 1): RSRP_(x+2) to RSRP_(x+15) RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2) and (Cell 5 - Cell 4), (Cell 7 - Cell 6): RSRP_(x-8) to RSRP_(x+1) The Test Tolerance values are taken from the analysis for the related 3DL Test case 9.1.37, and no separate analysis is needed.
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s / N_{oc}$ values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.45 4 DL CA PCell in TDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44	Same as 9.1.44
9.1.46 4DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44	Same as 9.1.44
9.1.47 4DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.44	Same as 9.1.44	Same as 9.1.44
9.1.48 5 DL FDD-TDD with PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB N_{oc4}: = N_{oc1} +1dB N_{oc5}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -1dB $\hat{E}s_6$ / N_{oc4}: +3dB $\hat{E}s_7$ / N_{oc4}: -1dB $\hat{E}s_8$ / N_{oc5}: +3dB $\hat{E}s_9$ / N_{oc5}: -1dB Reported absolute RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB 0dB +0.8dB 0dB +0.8dB Via mapping	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB N_{oc4}: = N_{oc1} +1dB N_{oc5}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -0.2dB $\hat{E}s_6$ / N_{oc4}: +3dB $\hat{E}s_7$ / N_{oc4}: -0.2dB $\hat{E}s_8$ / N_{oc5}: +3dB $\hat{E}s_9$ / N_{oc5}: -0.2dB Cell 1, absolute: RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 RSRP_20 to RSRP_32 depending on operating band Cell 2 and Cell 4, Cell 6, absolute: RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37

			RSRP_28 to RSRP_40 depending on Cell 1 band
	Reported relative RSRP values: (Cell 2 – Cell 1) and (Cell 4 – Cell 1), (Cell 6 – Cell 1), (Cell 8 – Cell 1): ±4.5dB for normal conditions ±6dB for extreme conditions (Cell 3 - Cell 2) and (Cell 5 - Cell 4), (Cell 7 - Cell 6), (Cell 9 – Cell 8): ±3dB	Via mapping Via mapping	Relative: (Cell 2 – Cell 1) and (Cell 4 – Cell 1),(Cell 6 –Cell 1), (Cell 8 – Cell 1): RSRP_(x+2) to RSRP_(x+15) RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2) and (Cell 5 - Cell 4), (Cell 7 - Cell 6), (Cell 9 – Cell 8): RSRP_(x-8) to RSRP_(x+1) The Test Tolerance values are taken from the analysis for the related 3DL Test case 9.1.37, and no separate analysis is needed.
9.1.49 5 DL FDD-TDD with PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48	Same as 9.1.48
9.1.50 5 DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48	Same as 9.1.48
9.1.51 5 DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.48	Same as 9.1.48	Same as 9.1.48
9.1.52 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported absolute RSRP values: Normal conditions: ±7dB Extreme conditions: ±10dB Reported relative RSRP values: Normal and extreme conditions: ±4dB Test 2: N_{oc}: -86dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported absolute RSRP values: Normal conditions: ±9dB Extreme conditions: ±12dB Reported relative RSRP values: Normal and extreme conditions: ±4dB Test 3: N_{oc}: -116dBm to -112.5 dBm/15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported absolute RSRP values: Normal conditions: ±7dB Extreme conditions: ±10dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -107dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_27 to RSRP_44 RSRP_24 to RSRP_47 RSRP_Cell 1 – 10 to RSRP_Cell 1 + 2 Test 2: N_{oc}: -87dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_45 to RSRP_66 RSRP_52 to RSRP_69 RSRP_Cell 1 – 10 to RSRP_Cell 1 + 2 Test 3: N_{oc}: -116dBm to -112.5 dBm/15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -0.2dB RSRP_16 to RSRP_33 RSRP_16 to RSRP_33 RSRP_17 to RSRP_34 RSRP_17 to RSRP_34 RSRP_18 to RSRP_35 RSRP_19 to RSRP_36 RSRP_19 to RSRP_36 RSRP_13 to RSRP_36 RSRP_13 to RSRP_36 RSRP_14 to RSRP_37 RSRP_14 to RSRP_37

	Reported relative RSRP values: Normal and extreme conditions: ±4dB		RSRP_15 to RSRP_38 RSRP_16 to RSRP_39 RSRP_16 to RSRP_39 RSRP_Cell 1 – 9 to RSRP_Cell 1 + 2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The absolute RSRP values given above are different for normal and extreme conditions. The relative RSRP values given above are for both normal and extreme conditions.		
9.1.53 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52	Same as 9.1.52
9.1.54 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52	Same as 9.1.52
9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell9.1.55 FS3 Intra frequency absolute and relative RSRP accuracies with FDD PCell	Test 1: N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: 3dB $\hat{E}s_3 / N_{oc2}$: -1dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values: (Cell 3 – Cell 2): ±3dB (Cell 3 – Cell 1): Normal condtion: ±4.5dB Extreme condtion: ±6dB	<u>Test 1:</u> 0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping Via mapping	<u>Test 1:</u> N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: 3dB $\hat{E}s_3 / N_{oc2}$: -0.2dB <u>Cell 3, absolute:</u> RSRP_18 to RSRP_31 RSRP_18 to RSRP_31 RSRP_19 to RSRP_32 RSRP_19 to RSRP_32 RSRP_20 to RSRP_33 RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 depending on operating band <u>Cell 3, absolute:</u> RSRP_13 to RSRP_35 RSRP_14 to RSRP_36 RSRP_14 to RSRP_36 RSRP_15 to RSRP_37 RSRP_15 to RSRP_37 RSRP_16 to RSRP_38 RSRP_17 to RSRP_39 depending on operating band <u>Relative:</u> RSRP_(x-8) to RSRP_(x+1) RSRP_(x-3) to RSRP_(x+12) RSRP_(x-4) to RSRP_(x+14)
	<u>The derivation of the RSRP values takes into account the uncertainty from all applicable Noc and Ês / Noc values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.</u>		
9.1.56 FS3 Intra frequency absolute and relative RSRP accuracies with TDD PCell	Same as 9.1.55	Same as 9.1.55	Same as 9.1.55
9.1.57 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	<u>Test 1:</u> $N_{oc:}$ = -99dBm/15kHz $\hat{E}s_1 / N_{oc}$: -12dB $\hat{E}s_2 / N_{oc}$: -14dB Reported absolute RSRP values: Normal condtion: ±8dB Extreme condtion: ±11dB Reported relative RSRP values:	<u>Test 1:</u> -0.3dB 0dB +0.1dB Via mapping Via mapping	<u>Test 1:</u> $N_{oc:}$ = -99.3dBm/15kHz $\hat{E}s_1 / N_{oc}$: -12dB $\hat{E}s_2 / N_{oc}$: -13.9dB <u>Cell 2, absolute:</u> RSRP_18 to RSRP_37 RSRP_15 to RSRP_40 <u>Relative:</u>

	Normal condtion: ±5dB Extreme condtion: ±5dB Test 2: N_{oc} = -79dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -14dB Reported absolute RSRP values: Normal condtion: ±10dB Extreme condtion: ±13dB Reported relative RSRP values: Normal condtion: ±5dB Extreme condtion: ±5dB Test 3: N_{oc} = -107dBm~-103.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -14dB Reported absolute RSRP values: Normal condtion: ±8dB Extreme condtion: ±11dB Reported relative RSRP values: Normal condtion: ±5dB Extreme condtion: ±5dB	 Test 2: -0.3dB 0dB +0.1dB Via mapping Via mapping Test 3: 0dB 0dB +0.1dB Via mapping Via mapping Via mapping	RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5) Test 2: N_{oc} = -79.3dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -13.9dB Cell 2, absolute: RSRP_36 to RSRP_59 RSRP_33 to RSRP_62 Relative: RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5) Test 3: N_{oc} = -107dBm~-103.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -13,9dB Cell 2, absolute: RSRP_10 to RSRP_29 RSRP_11 to RSRP_30 RSRP_11 to RSRP_30 RSRP_12 to RSRP_31 RSRP_12 to RSRP_31 RSRP_13 to RSRP_32 RSRP_14 to RSRP_33 depending on operating band Cell 2, absolute: RSRP_7 to RSRP_32 RSRP_8 to RSRP_33 RSRP_8 to RSRP_33 RSRP_9 to RSRP_34 RSRP_9 to RSRP_34 RSRP_10 to RSRP_35 RSRP_11 to RSRP_36 depending on operating band Relative: RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.58 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57	Same as 9.1.57
	Same as 9.1.57		
9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57	Same as 9.1.57
	Same as 9.1.57		
9.1.60 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB	0dB 0dB	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB

RS based discovery signal with FDD PCell	CRS $\hat{E}s_1$ / N_{oc1}: -4dB CRS $\hat{E}s_2$ / N_{oc2}: +3dB CRS $\hat{E}s_3$ / N_{oc2}: -1dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +9dB CSI-RS $\hat{E}s_3$ / N_{oc2}: +5dB Reported absolute RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions Reported relative RSRP values: (Cell 3 – Cell 2): ±2dB for normal conditions and ±3dB for extreme conditions	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	CRS $\hat{E}s_1$ / N_{oc1}: -4dB CRS $\hat{E}s_2$ / N_{oc2}: +3dB CRS $\hat{E}s_3$ / N_{oc2}: -1dB CSI-RS $\hat{E}s_2$ / N_{oc2}: +9dB CSI-RS $\hat{E}s_3$ / N_{oc2}: +5.8dB Cell 2, absolute: RSRP_27 to RSRP_40 RSRP_28 to RSRP_40 RSRP_28 to RSRP_41 RSRP_29 to RSRP_41 RSRP_29 to RSRP_42 RSRP_30 to RSRP_43 RSRP_31 to RSRP_43 depending on Cell 1 operating band Cell 3, absolute: RSRP_24 to RSRP_36 RSRP_25 to RSRP_37 RSRP_25 to RSRP_37 RSRP_26 to RSRP_38 RSRP_26 to RSRP_38 RSRP_27 to RSRP_39 RSRP_28 to RSRP_40 depending on Cell 1 operating band Relative: RSRP_(x-7) to RSRP_(x-1)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} ,CRS $\hat{E}s$ / N_{oc} and CSI-RS $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.61 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD PCell	Same as 9.1.60	Same as 9.1.60	Same as 9.1.60
9.1.68 3DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.37	Same as 9.1.37	Same as 9.1.37
9.1.69 4 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.44	Same as 9.1.44	Same as 9.1.44
9.1.70 5 DL RSRP for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.1.48	Same as 9.1.48	Same as 9.1.48
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±3.5dB Test 3:	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3:	Test 1: N_{oc}: -85.51Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_14 Test 3:

	N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	0dB +0.4dB +0.4dB Via mapping	N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.1.1_2 FDD Intra Frequency Absolute RSRQ Accuracy for UE Category 1bis	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±3.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±4.5dB Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±4.5dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.81Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_02 to RSRQ_18 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_16 Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -116dBm/15kHz $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.51Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRQ_14 Test 3: N_{oc}: -116dBm/15kHz $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 2 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.2.1_2 TDD Intra Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.1.1_2	Same as 9.2.1.1_2	Same as 9.2.1.1_2
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and	Test 1: 0dB -1.1dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_04 to RSRQ_16 (NTC)

	±4dB for extreme conditions		RSRQ_01 to RSRQ_19 (ETC)
	Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 3: 0dB 0.3dB 0dB 0.8dB Via mapping	Test 3: N_{oc1}: -119.5dBm to-116 dBm /15kHz depending on operating band N_{oc2}: -119.2dBm -115.7dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.3.1_2 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported RSRQ values: ±3.5dB for normal conditions and ±5dB for extreme conditions	Test 1: 0dB -1.1dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_02 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_21 (ETC)
	Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±4.5dB for normal conditions and ±5dB for extreme conditions	Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_19 (ETC)
	Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±4.5dB for normal conditions and ±5dB for extreme conditions	Test 3: 0dB 0.3dB 0dB 0.8dB Via mapping	Test 3: N_{oc1}: -119.5dBm to-116 dBm /15kHz depending on operating band N_{oc2}: -119.2dBm -115.7dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_19 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz	Test 1: -1.1dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB	Test 1: N_{oc1}: -81.1dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB

	N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB	0dB 0dB 0.8dB Via mapping Test 3: 0dB +0.3dB 0dB 0.8dB Via mapping	$\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11 Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.2dBm to -115.7dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$ and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.3.2_2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for UE Category 1bis	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported Relative RSRQ values: ±4dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±5dB Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±5dB	Test 1: -1.1dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB +0.3dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -81.1dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_x - 10 to RSRQ_x + 10 (NTC) RSRQ_x - 12 to RSRQ_x + 12 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 11 to RSRQ_x + 13 Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.2dBm to -115.7dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 11 to RSRQ_x + 13
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$ and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1		
9.2.4.1_1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy (Rel-12 and forward)	Same as 9.2.3.1		
9.2.4.1_2 TDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.1_2	Same as 9.2.3.1_2	Same as 9.2.3.1_2
9.2.4.2 TDD - TDD Inter Frequency Relative	Same as 9.2.3.2		

RSRQ Accuracy			
9.2.4.2_1 TDD - TDD Inter Frequency Relative RSRQ Accuracy (Rel-12 and forward)	Same as 9.2.3.2		
9.2.4.2_2 TDD - TDD Inter Frequency Relative RSRQ Accuracy for UE Category 1bis	Same as 9.2.3.2_2	Same as 9.2.3.2_2	Same as 9.2.3.2_2
9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4.0dB $\hat{E}s_2$ / N_{o2c}: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 1: 0dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.10dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC) Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.4A.1_2 FDD - TDD Inter Frequency Absolute RSRQ Accuracy for UE Category 1bis	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported RSRQ values: ±3.5dB for normal conditions and ±5dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4.0dB $\hat{E}s_2$ / N_{o2c}: -4.0dB Reported RSRQ values: ±4.5dB for normal conditions and ±5dB for extreme conditions Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±4.5dB for normal conditions and ±5dB for extreme conditions	Test 1: 0dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.10dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_02 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_21 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_19 (ETC) Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_18 (NTC) RSRQ_00 to RSRQ_19 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		

9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB	Test 1: -1.10dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -81.10dBm/15kHz N_{oc2}: -81.10dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 10 to RSRQ_x + 10 Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.4A.2_2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ for UE Category 1bis	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported Relative RSRQ values: ±4dB for normal conditions and ±5dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±5dB Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±5dB	Test 1: -1.10dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -81.10dBm/15kHz N_{oc2}: -81.10dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_x - 10 to RSRQ_x + 10 (NTC) RSRQ_x - 12 to RSRQ_x + 12 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 12 to RSRQ_x + 12 Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 12 to RSRQ_x + 12
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band	0dB 0dB	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band

	$\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB $\hat{E}s_3 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB +0.3dB 0dB Via mapping Via mapping	$\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.7dB $\hat{E}s_3 / N_{o2c}$: -4dB Cell 1: RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) Cell 2: RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.5.2 FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB $\hat{E}s_3 / N_{o2c}$: -4dB Reported RSRQ values: ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.7dB $\hat{E}s_3 / N_{o2c}$: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -1.0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.8dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -85.76Bm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -1.2dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -1.2dB RSRQ_04 to RSRQ_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Subset of 9.2.7.1	Same as 9.2.7.1	Subset of 9.2.7.1
9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported RSRQ values: ±2.5dB	Test 1: -1.0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -85.76Bm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -1.2dB RSRQ_04 to RSRQ_16

	Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +5.0dB $\hat{E}_{s2}$ / N_{oc}: -2.0dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}_{s1}$ / N_{oc}: +5.0dB $\hat{E}_{s2}$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 2: 0dB 0dB +0.8dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +5.0dB $\hat{E}_{s2}$ / N_{oc}: -1.2dB RSRQ_04 to RSRQ_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}_{s1}$ / N_{oc}: +5.0dB $\hat{E}_{s2}$ / N_{oc}: -3.05dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}_{s2}$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.10.1 TDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Subset of 9.2.9.1	Same as 9.2.9.1	Subset of 9.2.9.1
9.2.11.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.11.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -1.5dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -1.5dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: 0dB 0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -84.76Bm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -0.5dB RSRQ_05 to RSRQ_17 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -0.5dB RSRQ_05 to RSRQ_17 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}_{s1}$ / N_{oc}: +4.0dB $\hat{E}_{s2}$ / N_{oc}: +2.0dB $\hat{E}_{s3}$ / N_{oc}: -3.0dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 3 RSRQ from $\hat{E}_{s1}$ / N_{oc}, $\hat{E}_{s2}$ / N_{oc}, and $\hat{E}_{s3}$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.16.1 TDD RSRQ Accuracy under Time	Subset of 9.2.15.1	Same as 9.2.15.1	Subset of 9.2.15.1

Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)			
9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc}: -81.76dBm/15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -100.85dBm/15kHz $\hat{E}s_1 / N_{oc}$: -2.9dB $\hat{E}s_2 / N_{oc}$: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: -4.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -82.81Bm/15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -100.85dBm/15kHz $\hat{E}s_1 / N_{oc}$: -2.9dB $\hat{E}s_2 / N_{oc}$: -2.9dB RSRQ_00 to RSRP_14 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: -3.6dB $\hat{E}s_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -77dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: 113dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 1: 0dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0.3dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -78.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 (ETC) Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC) Test 3: N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -112.7dBm /15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.18.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -77dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions	Test 1: -1.1dB -1.1dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -78.1dBm/15kHz N_{oc2}: -78.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -101.7dBm/15kHz

	Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: 113dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB	Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB +0.3dB 0dB 0.8dB Via mapping	N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 9 to RSRQ_x + 11 Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -112.7dBm /15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_x - 9 to RSRQ_x + 11
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS	FFS
9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS	FFS
9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB Cell 1: RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) Cell 2: RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB Reported RSRQ values: ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	Same as 9.2.21.1	Same as 9.2.21.1
9.2.22.2 TDD Relative	Same as 9.2.21.2	Same as 9.2.21.2	Same as 9.2.21.2

RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz			
9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: -4dB $\hat{E}s_3 / N_{oc2}$: -4dB <u>Reported RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: -3.7dB $\hat{E}s_3 / N_{oc2}$: -4dB <u>Cell 1:</u> RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) <u>Cell 2:</u> RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: -4dB $\hat{E}s_3 / N_{oc2}$: -4dB <u>Reported RSRQ values:</u> ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: -3.7dB $\hat{E}s_3 / N_{oc2}$: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1	Same as 9.2.23.1
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.2	Same as 9.2.23.2	Same as 9.2.23.2
9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	<u>Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part</u>	<u>Same as 9.2.38 Cell 1 and Cell 2</u>	<u>Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part</u>
9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	<u>Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part</u>	<u>Same as 9.2.38 Cell 1 and Cell 2</u>	<u>Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part</u>
9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	<u>Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part</u>	<u>Same as 9.2.39 Cell 1 and Cell 2</u>	<u>Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part</u>
9.2.26.2 Relative RSRQ Accuracy for E-UTRAN	<u>Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part</u>	<u>Same as 9.2.39 Cell 1 and Cell 2</u>	<u>Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part</u>

TDD-FDD Carrier Aggregation with PCell in TDD			
9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Reported RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Cell 1:</u> RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) <u>Cell 2:</u> RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Reported RSRQ values:</u> ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	<u>Test 1:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	<u>Test 1:</u> 0dB +0.4dB +0.4dB Via mapping	<u>Test 1:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	<u>Test 1:</u> N_{oc}: -116dBm to -114dBm /15kHz $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	<u>Test 1:</u> 0dB +0.4dB +0.4dB Via mapping	<u>Test 1:</u> N_{oc}: -116dBm to -114dBm /15kHz $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.38 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{oc2}: -6dB $\hat{E}s_3$ / N_{oc3}: -6dB <u>Reported absolute RSRQ values:</u> ±3.5dB for normal conditions and	0.3dB 0dB 0dB +0.8dB +0.8dB +0.8dB	N_{oc1}: -119.2dBm to -115.7dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.20dB $\hat{E}s_2$ / N_{oc2}: -5.20dB $\hat{E}s_3$ / N_{oc3}: -5.20dB <u>Absolute:</u>

	±4dB for extreme conditions Reported relative RSRQ values: (Cell 2 – Cell 1) and (Cell 3 – Cell 1): ±4dB for normal conditions ±4dB for extreme conditions	Via mapping Via mapping	Cell 1, Cell 2, and Cell 3 RSRQ_0 to RSRQ_14 Relative: (Cell 2 – Cell 1) and (Cell 3 – Cell 1): RSRQ_(x-10) to RSRQ_(x+10)
	The derivation of the RSRQ values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Test 1: N_{oc1}: -117.5dBm to -114dBm/15kHz depending on operating band N_{oc2}: -117.5dBm to -114dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{o2c}: -6dB Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported absolute RSRQ values: ±4dB for both normal conditions and extreme conditions	Test 1: 0dB 0.3dB 0.8dB 0.8dB Via mapping	Test 1: N_{oc1}: -117.5dBm to-114 dBm /15kHz depending on operating band N_{oc2}: -117.2dBm -113.7dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.2dB $\hat{E}s_2$ / N_{o2c}: -5.2dB RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC) RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the absolute RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Test 1: N_{oc1}: -117.5dBm to -115.5dBm/15kHz depending on operating band N_{oc2}: -117.5dBm to -115.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{o2c}: -6dB Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported absolute RSRQ values: ±4dB for both normal conditions and extreme conditions	Test 1: 0dB 0.3dB 0.8dB 0.8dB Via mapping	Test 1: N_{oc1}: -117.5dBm to-115.5 dBm /15kHz depending on operating band N_{oc2}: -117.2dBm -115.2dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.2dB $\hat{E}s_2$ / N_{o2c}: -5.2dB RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC) RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the absolute RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.39 3DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.40 3DL FDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.41 3DL TDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±3.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB	Test 1: N_{oc}: -85.81Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_02 to RSRQ_18 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB

	$\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±4.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±4.5dB	0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	$\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1	Same as 9.2.42.1
9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±3.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±4.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±4.5dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.81Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_02 to RSRQ_18 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 2 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.45 4 DL CA PCell in FDD FDD-TDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band N_{oc4}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{oc2}: -6dB $\hat{E}s_3$ / N_{oc3}: -6dB $\hat{E}s_4$ / N_{oc4}: -6dB Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported relative RSRQ values: (Cell 2 – Cell 1) , (Cell 3 – Cell 1) and (Cell 4 – Cell 1) : ±4dB for normal conditions ±4dB for extreme conditions	0.3dB 0dB 0dB 0dB +0.8dB +0.8dB +0.8dB +0.8dB Via mapping Via mapping	N_{oc1}: -119.2dBm to -115.7dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band N_{oc4}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.20dB $\hat{E}s_2$ / N_{oc2}: -5.20dB $\hat{E}s_3$ / N_{oc3}: -5.20dB $\hat{E}s_3$ / N_{oc3}: -5.20dB Absolute: Cell 1, Cell 2, Cell 3 and Cell 4 RSRQ_00 to RSRQ_14 (NC) RSRQ_00 to RSRQ_15 (EC) Relative: (Cell 2 – Cell 1) , (Cell 3 – Cell 1) and (Cell 4 – Cell 1): RSRQ_(x-10) to RSRQ_(x+10)

			The Test Tolerance values are taken from the analysis for the related 3DL Test case 9.2.38, and no separate analysis is needed
	The derivation of the RSRQ values takes into account the uncertainty from all applicable Noc and Ês / Noc values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.2.46 4DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.45	Same as 9.2.45	Same as 9.2.45
9.2.47 5 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band N_{oc4}: -116dBm to -114dBm /15kHz depending on operating band N_{oc5}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{oc2}: -6dB $\hat{E}s_3$ / N_{oc3}: -6dB $\hat{E}s_4$ / N_{oc4}: -6dB $\hat{E}s_5$ / N_{oc5}: -6dB <u>Reported absolute RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions <u>Reported relative RSRQ values:</u> (Cell 2 – Cell 1) , (Cell 3 – Cell 1) , (Cell 4 – Cell 1) and (Cell 5 – Cell 1) : ±4dB for normal conditions ±4dB for extreme conditions	0.3dB 0dB 0dB 0dB 0dB +0.8dB +0.8dB +0.8dB +0.8dB +0.8dB Via mapping Via mapping	N_{oc1}: -119.2dBm to -115.7dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band N_{oc4}: -116dBm to -114dBm /15kHz depending on operating band N_{oc5}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.20dB $\hat{E}s_2$ / N_{oc2}: -5.20dB $\hat{E}s_3$ / N_{oc3}: -5.20dB $\hat{E}s_4$ / N_{oc4}: -5.20dB $\hat{E}s_5$ / N_{oc5}: -5.20dB <u>Absolute:</u> Cell 1, Cell 2, Cell 3, Cell 4 and Cell 5 RSRQ_00 to RSRQ_14 (NC) RSRQ_00 to RSRQ_15 (EC) <u>Relative:</u> (Cell 2 – Cell 1) , (Cell 3 – Cell 1) , (Cell 4 – Cell 1) and (Cell 5 – Cell 1): RSRQ_(x-10) to RSRQ_(x+10) The Test Tolerance values are taken from the analysis for the related 4DL Test case 9.2.45, and no separate analysis is needed
	The derivation of the RSRQ values takes into account the uncertainty from all applicable Noc and Ês / Noc values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.2.48 5 DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.47	Same as 9.2.47	Same as 9.2.47
9.2.51 FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	N_{oc1}: -119dBm to -116dBm/15kHz depending on operating band N_{oc2} and N_{oc3}: N_{oc1} +3.5dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -4dB $\hat{E}s_3$ / N_{oc2}: -4dB <u>Reported absolute RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions <u>Reported absolute RSRQ values:</u> ±4dB for both normal conditions and extreme conditions	0dB 0dB 0dB 0dB 0.3dB Via mapping	N_{oc1}: -119dBm to -116dBm/15kHz depending on operating band N_{oc2} and N_{oc3}: N_{oc1} +3.5dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -4dB $\hat{E}s_3$ / N_{oc2}: -3.7dB <u>RSRQ_00 to RSRQ_14 (NTC)</u> <u>RSRQ_00 to RSRQ_15 (ETC)</u> RSRQ_x - 12 to RSRQ_x + 9
9.2.52 TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3	<u>Same as 9.2.51</u>	<u>Same as 9.2.51</u>	<u>Same as 9.2.51</u>
9.2.55 3DL RSRP for E-	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38

UTRAN in Carrier Aggregation with generic duplex modes			
9.2.56 4 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.2.45	Same as 9.2.45	Same as 9.2.45
9.2.57 5 DL RSRQ for E-UTRAN in Carrier Aggregation with generic duplex modes	Same as 9.2.47	Same as 9.2.47	Same as 9.2.47
9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -60.00dBm/3.84MHz Ior / Ioc: +9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_RSCP values: ±8dB Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -94.46dBm or -92.46dBm or -90.96dBm or -91.46dBm or -93.46dBm /3.84MHz depending on operating band Ior / Ioc: -9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_RSCP values: ±6dB	Test 1: 0dB 0dB -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0.7dB 0.35dB 0dB Via mapping	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -60.75dBm/3.84MHz Ior / Ioc: +9.54dB CPICH_Ec/Ior: -10.00dB CPICH_RSCP_46 to CPICH_RSCP_63 Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -93.76dBm or -91.76dBm or -90.26dBm or -90.76dBm or -92.76dBm /3.84MHz depending on operating band Ior / Ioc: -9.19dB CPICH_Ec/Ior: -10.00dB CPICH_RSCP_-04 to CPICH_RSCP_9 CPICH_RSCP_-02 to CPICH_RSCP_11 CPICH_RSCP_-01 to CPICH_RSCP_12 CPICH_RSCP_-03 to CPICH_RSCP_10 depending on operating band
	The derivation of the CPICH_RSCP values takes into account the uncertainty in Cell 2 CPICH_RSCP from Ioc, Ior / Ioc and CPICH_Ec/Ior, the allowed UE reporting accuracy, and the UE mapping function. The CPICH_RSCP values given above are for normal conditions. In all cases the CPICH_RSCP values are 3dB wider at each end for extreme conditions.		
9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy	Same as 9.3.1	Same as 9.3.1	Same as 9.3.1
9.3.3 E UTRAN FDD UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Same as 9.3.1	Same as 9.3.1	Same as 9.3.1
9.4.1 E-UTRAN FDD – UTRA FDD CPICH Ec/No absolute accuracy	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -52.22dBm/3.84MHz Ior / Ioc: -1.75dB CPICH_Ec/Ior: -10.00dB Reported CPICH_Ec/Io accuracy values: ±1.5dB for normal conditions and ±3dB for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -87.27dBm/3.84MHz Ior / Ioc: -4.7dB	Test 1: 0dB -0dB -0.9dB 0.3dB 0dB Via mapping Test 2: 0dB 0dB 0dB	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -53.12dBm/3.84MHz Ior / Ioc: -1.45dB CPICH_Ec/Ior: -10.00dB CPICH_Ec/Io_17 to CPICH_Ec/Io_24 for normal conditions. CPICH_Ec/Io_14 to CPICH_Ec/Io_27 for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -87.27dBm/3.84MHz Ior / Ioc: -4.4dB CPICH_Ec/Ior: -10.00dB

	CPICH_Ec/Ior: -10.00dB Reported CPICH_Ec/Io accuracy values: ±2dB for normal conditions and ±3dB for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -94.46dBm or -92.46dBm or 90.96dBm or -91.46dBm or -93.46dBm/3.84MHz depending on operating band Ior / Ioc: -9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_Ec/Io accuracy values: -4.2 to +3dB for normal conditions and extreme conditions. The additional 1.2 dB relaxation to the lower limit for both normal and extreme condition is to take into account the effect of thermal noise and noise generated in the receiver as specified in A.9.4.1.3 of TS 36.133 [4]	0.3dB 0dB Via mapping Test 3: 0dB 0dB 0.7dB 0.4dB 0dB Via mapping	CPICH_Ec/Io_13 to CPICH_Ec/Io_22 for normal conditions. CPICH_Ec/Io_11 to CPICH_Ec/Io_24 for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -93.76dBm or -91.76dBm or 90.26dBm or -90.76dBm or -92.76dBm /3.84MHz depending on operating band Ior / Ioc: -9.14dB CPICH_Ec/Ior: -10.00dB CPICH_Ec/Io_0 to CPICH_Ec/Io_16 for normal and extreme conditions.
9.4.2 E-UTRAN TDD – UTRA FDD CPICH Ec/No absolute accuracy	Same as 9.4.1	Same as 9.4.1	Same as 9.4.1
9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Same as 9.4.1	Same as 9.4.1	Same as 9.4.1
9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -54.1dBm/1.28MHz Ior / Ioc: 2.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±8dB for normal conditions and ±11dB for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -75.2dBm/1.28MHz Ior / Ioc: 5.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±8dB for normal conditions and ±11dB for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -97.0dBm/1.28MHz	Test 1: 0dB 0dB -0.8dB 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB 0dB 0dB Via mapping Test 3: 0dB 0dB	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -54.9dBm/1.28MHz Ior / Ioc: 2.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 51 to PCCPCH RSCP 68 for normal conditions. PCCPCH RSCP 48 to PCCPCH RSCP 71 for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -75.2dBm/1.28MHz Ior / Ioc: 5.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 34 to PCCPCH RSCP 51 for normal conditions. PCCPCH RSCP 31 to PCCPCH RSCP 54 for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -96.2dBm/1.28MHz

	Ior / Ioc: 0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±6dB for normal conditions and ±9dB for extreme conditions	0.8dB 0dB 0dB 0dB Via mapping	Ior / Ioc: 0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 10 to PCCPCH RSCP 23 for normal conditions. PCCPCH RSCP 07 to PCCPCH RSCP 26 for extreme conditions
9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Same as 9.5.1	Same as 9.5.1	Same as 9.5.1
9.6.1 GSM RSSI accuracy for E-UTRAN FDD	Subtest 1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -38.5dBm GSM Cell 3 Signal level: -38.5dBm Subtest 2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -48.5dBm GSM Cell 3 Signal level: -48.5dBm Subtest 3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -70.5dBm GSM Cell 3 Signal level: -70.5dBm Subtest 4: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -109.5dBm GSM Cell 3 Signal level: -109.5dBm Subtest 5: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -57.5dBm GSM Cell 3 Signal level: -54.5dBm Subtest 6: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -64.5dBm GSM Cell 3 Signal level: -59.5dBm Subtest 7:	Subtest 1: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 0 dB Subtest 2: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 -1.5 dB Subtest 3: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 0 dB Subtest 4: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 +0.2 dB GSM Cell 3 0 dB Subtest 5: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0.dB GSM Cell 3 0 dB Subtest 6: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 7:	Subtest 1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -38.7dBm GSM Cell 3 Signal level: -38.5dBm Subtest 2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -48.7dBm GSM Cell 3 Signal level: -50.0dBm Subtest 3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -70.7dBm GSM Cell 3 Signal level: -70.5dBm Subtest 4: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -109.3dBm GSM Cell 3 Signal level: -109.5dBm Subtest 5: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -57.5dBm GSM Cell 3 Signal level: -54.5dBm Subtest 6: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -64.5dBm GSM Cell 3 Signal level: -59.5dBm Subtest 7: E-UTRA Cell 1

	E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -71.5dBm GSM Cell 3 Signal level: -64.5dBm Subtest 8: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -78.5dBm GSM Cell 3 Signal level: -69.5dBm Subtest 9: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85.5dBm GSM Cell 3 Signal level: -74.5dBm Subtest 10: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -92.5dBm GSM Cell 3 Signal level: -79.5dBm Subtest 11: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -99.5dBm GSM Cell 3 Signal level: -84.5dBm Subtest 12: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -106.5dBm GSM Cell 3 Signal level: -89.5dBm	E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 8: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 9: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 10: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 11: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 12: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB	N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -71.5dBm GSM Cell 3 Signal level: -64.5dBm Subtest 8: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -78.5dBm GSM Cell 3 Signal level: -69.5dBm Subtest 9: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85.5dBm GSM Cell 3 Signal level: -74.5dBm Subtest 10: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -92.5dBm GSM Cell 3 Signal level: -79.5dBm Subtest 11: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -99.5dBm GSM Cell 3 Signal level: -84.5dBm Subtest 12: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -106.5dBm GSM Cell 3 Signal level: -89.5dBm
9.6.2 GSM RSSI accuracy for E-UTRAN TDD	Same as 9.6.1	Same as 9.6.1	Same as 9.6.1
9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Noc: -122dBm to -118.5dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±6dB	1.6dB 0dB Via mapping	Noc: -120.4dBm to -116.9dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRP_9 to RSRP_24 RSRP_10 to RSRP_25 RSRP_10 to RSRP_25 RSRP_11 to RSRP_26 RSRP_12 to RSRP_27 RSRP_12 to RSRP_27 depending on operating band
9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Noc: -122dBm to -118.5dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values:	1.6dB 0dB Via mapping	Noc: -120.4dBm to -116.9dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB

	±4.5dB for normal condition ±9dB for extreme condition		Normal condition: RSRP_10 to RSRP_22 RSRP_11 to RSRP_23 RSRP_11 to RSRP_23 RSRP_12 to RSRP_24 RSRP_12 to RSRP_24 RSRP_13 to RSRP_25 RSRP_14 to RSRP_26 depending on operating band Extreme condition: RSRP_6 to RSRP_27 RSRP_6 to RSRP_27 RSRP_7 to RSRP_28 RSRP_7 to RSRP_28 RSRP_8 to RSRP_29 RSRP_9 to RSRP_30 RSRP_9 to RSRP_30 depending on operating band
9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc}: -122dBm to -118.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	1.6dB 0dB Via mapping	N_{oc}: -120.4dBm to -116.9dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC)
9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±6dB	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRP_9 to RSRP_24 RSRP_10 to RSRP_25 RSRP_12 to RSRP_27 depending on operating band
9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±4.5dB for normal condition ±9dB for extreme condition	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Normal condition: RSRP_10 to RSRP_22 RSRP_11 to RSRP_23 RSRP_12 to RSRP_24 depending on operating band Extreme condition: RSRP_6 to RSRP_27 RSRP_7 to RSRP_28 RSRP_8 to RSRP_29 depending on operating band
9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC)
9.11.1 FS3 average RSSI accuracy case (PCell using FDD)	Noc_1: -106 dBm / 15kHz Noc_2: -106 dBm / 15kHz outside RMTC Noc_2: -83 dBm / 15kHz during RMTC Ês1 / Noc: 2.5dB Ês2 / Noc: 2.5dB outside RMTC Ês2 / Noc: -Infinity during RMTC Reported RSSI values: ±2.5dB for normal condition ±5.5dB for extreme condition	0dB 0dB Via mapping	Noc_1: -106 dBm / 15kHz Noc_2: -106 dBm / 15kHz outside RMTC Noc_2: -83 dBm / 15kHz during RMTC Ês1 / Noc: 2.5dB Ês2 / Noc: 2.5dB outside RMTC Ês2 / Noc: -Infinity during RMTC Reported RSSI values: RSSI_44 to RSSI_53 for normal condition RSSI_41 to RSSI_56 for extreme condition
9.11.2 FS3 average RSSI accuracy case (PCell using TDD)	Same as 9.11.1	Same as 9.11.1	Same as 9.11.1

9.12.1 FS3 channel occupancy test (PCell using FDD)	Noc_1: -106 dBm / 15kHz Noc_2: -106 dBm / 15kHz outside RMTC Noc_2: -96.28 dBm / 15kHz during RMTC and Channel Ocuppancy below threshold Noc_2: -91.28 dBm / 15kHz during RMTC and Channel Ocuppancy above threshold Ês1 / Noc: 2.5dB Ês2 / Noc: 2.5dB outside RMTC Ês2 / Noc: -Infinity during RMTC	0 dB 0 dB -1.89dB for normal conditions -4.89dB for extreme conditions 1.87dB for normal conditions 4.87dB for extreme conditions 0dB	Noc_1: -106 dBm / 15kHz Noc_2: -106 dBm / 15kHz outside RMTC Noc_2: -98.17 dBm / 15kHz for NC and -101.17 dBm / 15 KHz for EC during RMTC and Channel Ocuppancy below threshold Noc_2: -89.41 dBm / 15kHz for NC and -86.41 dBm / 15 KHz for EC during RMTC and Channel Ocuppancy above threshold Ês1 / Noc: 2.5dB Ês2 / Noc: 2.5dB outside RMTC Ês2 / Noc: -Infinity during RMTC
9.12.2 FS3 channel occupancy test (PCell using TDD)	Same as 9.12.1	Same as 9.12.1	Same as 9.12.1
10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	SNRs as specified	0.6dB	During T1: Formula: SNR + TT During T2: Formula: SNR - TT During T3: Formula: SNR+ TT
10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	During T1: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -infinity SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB During T2: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -3.0dB SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB	During T1: EUTRA Cell: 0dB 0dB SyncRef UE: 0dB 0dB During T2: EUTRA Cell 0dB 0.6 dB SyncRef UE : 0dB 0dB	During T1: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -infinity SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB During T2: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -2.4dB SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0 dB
11.1 V2V UE Transmission Timing Accuracy Test	Uplink timing: ±12T_s GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm	±3T_s 0dB 0dB 0dB 0dB	Uplink timing: ±15T_s GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm
11.2 Interruptions due to V2V sidelink communication	N_{oc}: -98dBm /15kHz $\hat{E}_s$ / N_{oc}: 16dB GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm	0dB 0dB 0dB 0dB 0dB 0dB	N_{oc}: -98dBm /15kHz $\hat{E}_s$ / N_{oc}: 16dB GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm
12.1.1 V2X UE Transmission Timing Accuracy Test for eNB as Timing Reference	Uplink timing: ±12T_s GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm	±3T_s 0dB 0dB 0dB 0dB	Uplink timing: ±15T_s GNSS Signal Power: GPS: -128.5dBm Galileo: -127dBm GLONASS: -131dBm BDS: -133dBm

12.1.2 V2X UE Transmission Timing Accuracy Test for SyncRef UE as Timing Reference	Uplink timing: ±12T_s	±3T_s	Uplink timing: ±15T_s
12.2.1 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for eNB as Timing Reference	During T1: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: +4.5dB During T2: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: -4.5dB During T3: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: +4.5dB	During T1: 0dB 1.1dB During T2: 0dB -1.1dB During T3: 0dB 1.1dB	During T1: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: +5.6dB During T2: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: -5.6dB During T3: N_{oc}: -110dBm/15kHz $\hat{E}_s$ / N_{oc}: +5.6dB
12.3.1 V2X Synchronization Reference Selection/Reselection Tests for GNSS configured as the highest priority	During T1: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T3: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0dB $\hat{E}_{s2}$ / N_{oc}: 3dB	During T1: 0dB 0dB 0dB During T2: 0dB 0.3dB 0dB During T3: 0dB 0.3dB 0.5dB	During T1: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0.3dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T3: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0.3dB $\hat{E}_{s2}$ / N_{oc}: 3.5dB
12.3.2 V2X Synchronization Reference Selection/Reselection Tests for eNB configured as the highest priority	During T1: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T3: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0dB $\hat{E}_{s2}$ / N_{oc}: 3dB	During T1: 0dB 0dB 0dB During T2: 0dB 0.3dB 0dB During T3: 0dB 0.3dB 0.5dB	During T1: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -infinity $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0.3dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T3: N_{oc}: -95dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: 0.3dB $\hat{E}_{s2}$ / N_{oc}: 3.5dB
12.2.2 Initiation/Cease of SLSS Transmission with V2X Sidelink Communication for SyncRef UE as Timing Reference	During T1: N_{oc}: -101dBm/15kHz $\hat{E}_s$ / N_{oc}: +5.5dB During T2: N_{oc}: -101dBm/15kHz $\hat{E}_s$ / N_{oc}: -3.5dB During T3: N_{oc}: -101dBm/15kHz $\hat{E}_s$ / N_{oc}: +5.5dB	During T1: -1.6dB 3.2dB During T2: -1.6dB 0dB During T3: -1.6dB 3.2dB	During T1: N_{oc}: -102.6dBm/15kHz $\hat{E}_s$ / N_{oc}: +8.7dB During T2: N_{oc}: -102.6dBm/15kHz $\hat{E}_s$ / N_{oc}: -3.5dB During T3: N_{oc}: -102.6dBm/15kHz $\hat{E}_s$ / N_{oc}: +8.7dB
12.4 Congestion Control Measurement Test for V2X UE	During T1: N_{oc}: -106dBm/15kHz PUCCH $\hat{E}_s$ / N_{oc}: +7.19dB During T2: N_{oc}: -106dBm/15kHz PUCCH $\hat{E}_s$ / N_{oc}: +13.19dB	During T1: 0dB -2.3dB During T2: 0dB 1.7dB	During T1: N_{oc}: -106dBm/15kHz PUCCH $\hat{E}_s$ / N_{oc}: +4.89dB During T2: N_{oc}: -106dBm/15kHz PUCCH $\hat{E}_s$ / N_{oc}: +14.89dB
12.5 Interruptions due to V2X Sidelink Communication	During T1, T2 and T3: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 16dB	During T1: 0dB 0dB	During T1, T2 and T3: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 16dB
12.6.1 V2X UE Autonomous Resource Selection/Reselection	During T1: N_{oc}: -103dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: 2dB	During T1: 0dB 4.1dB	During T1: N_{oc}: -103dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: 6.1dB

Tests for PSSCH-RSRP measurements	During T2: N_{oc}: -113dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: 2dB	During T2: 0dB -4.1dB	During T2: N_{oc}: -113dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: -2.1dB
12.6.2 V2X UE Autonomous Resource Selection/Reselection Tests for S-RSSI measurements	During T1: N_{oc}: -105dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: 2dB	During T1: 0dB 0dB	During T1: N_{oc}: -105dBm/15kHz PSSCH $\hat{E}_s$ / N_{oc}: 2dB

Annex G (normative): Statistical Testing

G.1 General

FSS

G.2 Statistical testing of delay and UE measurement performance in RRM tests

G.2.1 General

The RRM tests are either of deterministic or of statistical nature. The pass fail limits in tests of statistical nature are expressed as a limit (e.g. delay limit) and a success ratio applicable for the limit. The success ratio is 90% uniform (the complement is the error ratio ER = 10%).

G.2.2 Design of the test

The test is defined by the following design principles (see TS 36.521-1 clause G.X, Theory):

1) The early decision concept is applied.

2) A second limit is introduced: bad DUT factor M>1

To decide the test pass:

Supplier risk is applied based on the bad DUT quality

To decide the test fails

Customer risk is applied based on the specified DUT quality

The test is defined by the following parameters:

1) Limit ER = 0.1 (success ratio = 90%)

2) Bad DUT factor M=1.5 (selectivity)

3) Confidence level CL = 95% (for specified DUT and bad DUT-quality)

G.2.3 Numerical definition of the pass fail limits

Table G.2.3-1: pass fail limits

ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f
0	33	NA	43	408	283	86	737	644	129	1056	1021
1	46	NA	44	416	291	87	745	653	130	1064	1030
2	58	2	45	424	299	88	752	661	131	1071	1039
3	69	5	46	432	307	89	760	670	132	1078	1048
4	79	8	47	440	315	90	767	679	133	1086	1057
5	89	12	48	447	324	91	775	687	134	1093	1066
6	99	17	49	455	332	92	782	696	135	1100	1074
7	109	22	50	463	340	93	790	705	136	1108	1083
8	118	27	51	471	348	94	797	713	137	1115	1092
9	127	33	52	478	356	95	804	722	138	1122	1101
10	136	39	53	486	365	96	812	731	139	1130	1110
11	145	45	54	494	373	97	819	739	140	1137	1119
12	154	51	55	502	381	98	827	748	141	1144	1128
13	163	58	56	509	389	99	834	757	142	1152	1137
14	172	64	57	517	398	100	842	766	143	1159	1147
15	180	71	58	525	406	101	849	774	144	1166	1155
16	189	78	59	532	414	102	857	783	145	1174	1164
17	197	85	60	540	423	103	864	792	146	1181	1173
18	206	92	61	548	431	104	871	801	147	NA	1182
19	214	99	62	555	440	105	879	809	148		
20	223	106	63	563	448	106	886	818	149		
21	231	113	64	571	456	107	894	827	150		
22	239	120	65	578	465	108	901	836	151		
23	248	128	66	586	473	109	909	844	152		
24	256	135	67	594	482	110	916	853	153		
25	264	142	68	601	490	111	923	862	154		
26	272	150	69	609	499	112	931	871	155		
27	281	157	70	616	507	113	938	880	156		
28	289	165	71	624	516	114	946	888	157		
29	297	173	72	632	524	115	953	897	158		
30	305	180	73	639	533	116	960	906	159		
31	313	188	74	647	541	117	968	915	160		
32	321	196	75	654	550	118	975	924	161		
33	329	204	76	662	558	119	983	933	162		
34	337	211	77	669	567	120	990	941	163		
35	345	219	78	677	575	121	997	950	164		
36	353	227	79	684	584	122	1005	959	165		
37	361	235	80	692	592	123	1012	968	166		
38	369	243	81	700	601	124	1019	977	167		
39	377	251	82	707	610	125	1027	986	168		
40	385	259	83	715	618	126	1034	994	169		
41	393	267	84	722	627	127	1042	1003			
42	400	275	85	730	635	128	1049	1012			

The first column is the number of errors (ne = number of exceeded delays or number of wrong reports)

The second column is the number of samples for the pass limit (ns_p , ns=Number of samples= number of successes + number of exceedings or number of reports)

The third column is the number of samples for the fail limit (ns_f)

G.2.4 Pass fail decision rules

The pass fail decision rules apply for a single test, comprising one component in the test vector. The over all Pass /Fail conditions are defined in clause G.2.6

Having observed 0 errors, pass the test at 33+ samples, otherwise continue

Having observed 1 error, pass the test at 46+ samples, otherwise continue

Having observed 2 errors, pass the test at 58+ samples, fail the test at 2 samples, otherwise continue

Having observed 146 errors, pass the test at 1181+ samples, fail the test at 1173- samples, otherwise continue

Having observed 147 errors, fail the test at 1182- samples,

Where x+ means: x or more, x- means x or less

NOTE 1: an ideal DUT passes after 33 samples. The maximum test time is 1181 samples.

G.2.5 Void

G.2.6 Test conditions for delay tests and UE measurement performance

Table G.2.6-1: test conditions

Test	**Statistical independence**	**Number of components in the test vector, as specified in the test requirements and initial conditions of the applicable test**	**-**	**Over all Pass/Fail condition**
All tests in clauses 4, 5, 6.1, 7.2, 7.3 and 8 are delay tests of statistical nature while 6.2 and 7.1 are not applicable, since deterministic.	Test procedure in all statistical tests ensures independency	1 per operating band (if tested, see 3A.3.3)		Full set of environmental conditions (5) per operating band
All tests in clause 9 are UE level reports of statistical nature	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band		Full set of environmental conditions (5) per operating band

G.X Theory to derive the numbers in Table G.2.3-1 (informative)

TS 36.521-1 Annex G.X applies

Annex H (normative): Default Message Contents

This annex contains the default values of common messages specific to RRM, other than those described in TS 36.508 [7]. The message contents shall apply to test cases accordingly and unless indicated otherwise in specific test cases, shall be transmitted and checked by the system simulator. The default message contents can be defined for FDD Mode, or TDD Mode or both FDD/TDD Modes. All the messages are listed in alphabetical order based on conformance tests.

NOTE: For example, test case 8.1.1 has an exception for RRCConnectionReconfiguration message and therefore uses message contents according to TS 36.508 [7] with the exception of the RRCConnectionReconfiguration message specified in Annex H.

H.1 Common contents of system information messages exceptions

This clause contains the default values of common system information messages, other than those described in TS 36.508 [7].

H.2 Common contents of system information blocks exceptions

This clause contains the default values of common system information blocks, other than those described in TS 36.508 [7].

H.2.1 System information blocks message contents exceptions for E-UTRAN intra frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

Table H.2.1-1: *SystemInformationBlockType3*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionInfoCommon SEQUENCE {			
q-Hyst	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			

SystemInformationBlockType4: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

For Cell 2

Table H.2.1-2: *SystemInformationBlockType4*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

H.2.2 System information blocks message contents exceptions for E-UTRAN inter frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection

Table H.2.2-1: *SystemInformationBlockType3*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1	Cell 1
	Not Present		Cell 2
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4		Cell 1
	5		Cell 2
}			

SystemInformationBlockType5: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection case

For Cell 1

Table H.2.2-2: *SystemInformationBlockType5*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	5 for cell 1		
}			

For Cell 2

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	4 for cell 2		
}			
interFreqNeighCellList[*n*] SEQUENCE (SIZE (1..maxCellInter)) OF SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			

H.2.3 System information blocks message contents exceptions for E-UTRAN inter-RAT cell re-selection

SystemInformationBlockType3: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-1: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1 (E-UTRA)	
}			

SystemInformationBlockType6: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-2: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-High	20 (40 dB)	40 is actual value in dB (20 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)	Default value in TS 36.508	
q-QualMin	-20 (-20 dB)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-3: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	23 (46 dB)	46 is actual value in dB (23 * 2 dB); for Cell 1 (E-UTRA)	
}			

SystemInformationBlockType6: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-4: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-5: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-6: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low	21 (42 dB)	42 is actual value in dB (21 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
q-QualMin	-20 (-20 dB)		
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-7: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	23 (46 dB)	46 is actual value in dB (23 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-8: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
}			

SystemInformationBlockType3: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-9: *SystemInformationBlockType3*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4		

SystemInformationBlockType7: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-10: *SystemInformationBlockType7*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-6 SystemInformationBlockType7			
Information Element	Value/remark	Comment	Condition
commonInfo SEQUENCE {			
cellReselectionPriority	0		
ncc-Permitted	'11111111'B		
q-RxLevMin	5 (-105 dBm)	-105 is actual value in dBm (5 * 2 - 115 dBm)	
p-MaxGERAN	23 (23 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	24 (24 dBm)		DCS 1800 & PCS 1900
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	

SystemInformationBlockType3: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Table H.2.3-11: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	1		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)	For RF/RRM test cases	
s-IntraSearch	Not present		
t-ReselectionEUTRA	0		

SystemInformationBlockType8: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Table H.2.3-12: *SystemInformationBlockType8*: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParametersHRPD SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA -BandClass)) OF SEQUENCE {	1 entry		
cellReselectionPriority	0		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	28(-14)	INTEGER (0..63)	
}			
}			
t-ReselectionCDMA2000	0	INTEGER (0..7)	
}			

System Information Block Type 3: for E-UTRAN to UTRAN inter-RAT cell re-selection

Table H.2.3-13: System Information Block type3: Inter-RAT E-UTRAN FDD/TDD - UTRAN FDD cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- Cell selection and reselection info			
- Qqualmin	-20		
- Qrxlevlmin	-58 (-115dBm)		
- Maximum allowed UL TX power	21		

Table H.2.3-14: System Information Block type 3 (1.28 Mcps TDD): inter-RAT E-UTRAN FDD/TDD – UTRAN TDD cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- SIB4 Indicator	TRUE		
- Cell identity	0000 0000 0000 0000 0000 0000 0001B		
- Cell selection and re-selection info			
- Mapping info	Not present		
- Cell selection and reselection quality measure	(no data)		
- CHOICE mode	TDD		
- Sintrasearch	10 dB		
- Sintersearch	10 dB		
- SsearchHCS	Not present		
- RAT List	Not present		
- Qrxlevmin	-103 dBm		
- Qhyst1s	0 dB		
- Treselections	0 seconds		
- HCS Serving cell information	Not present		

SystemInformationBlockType3: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Table H.2.3-15: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	1		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)	For RF/RRM test cases	
s-IntraSearch	Not present		
t-ReselectionEUTRA	0		
}			

SystemInformationBlockType8: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Table H.2.3-16: *SystemInformationBlockType8*: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParameters1XRTT SEQUENCE {			1XRTT
longCodeState1XRTT	Not Present		
cellReselectionParameters1XRTT SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA -BandClass)) OF SEQUENCE {	1 entry		
cellReselectionPriority	0		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	56(-28)	INTEGER (0..63)	
}			
t-ReselectionCDMA2000	0	INTEGER (0..7)	
t-ReselectionCDMA2000-SF	Not Present		
}			
}			
}			

H.2.4 System information blocks message contents exceptions for E-UTRAN radio link monitoring (RLM)

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for out-of-sync

Table H.2.4-1: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for out-of-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
radioResourceConfigCommon SEQUENCE {			
pdsch-ConfigCommon SEQUENCE {			
referenceSignalPower	Set to an arbitrarily selected value above -11dBm and within the IE allowed range described in TS 36.331 [5]	The selected IE value depends on the test system implementation and should be declared in the test report.	
}			
soundingRS-UL-ConfigCommon CHOICE {			
release	NULL		
}			
}			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms0		
n310	n1		
t311	ms1000		
n311	n1		
}			

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for in-sync

Table H.2.4-2: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for in-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
radioResourceConfigCommon SEQUENCE {			
pdsch-ConfigCommon SEQUENCE {			
referenceSignalPower	Set to an arbitrarily selected value above -11dBm and within the IE allowed range described in TS 36.331 [5]	The selected IE value depends on the test system implementation and should be declared in the test report.	
}			
soundingRS-UL-ConfigCommon CHOICE {			
release	NULL		
}			
}			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms2000		
n310	n1		
t311	ms1000		
n311	n1		
}			

H.2.5 System information blocks message contents exceptions for RRC Re-establishment

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Intra-frequency RRC Re-establishment

Table H.2.5-1: *SystemInformationBlockType2*: E-UTRAN FDD Intra-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms3000		
n310	n1		
n311	n1		

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Inter-frequency RRC Re-establishment

Table H.2.5-2: *SystemInformationBlockType2*: E-UTRAN FDD Inter-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms5000		
n310	n1		
n311	n1		

H.2.6 System information block messages and information elements contents exceptions for E-UTRAN Random Access

SystemInformationBlockType1: (FDD/TDD) for E-UTRAN random access

Table H.2.6-1: *SystemInformationBlockType1*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table H.2.6-1a: *SystemInformationBlockType1-BR-r13*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3A SystemInformationBlockType1-BR-r13			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
p-Max	23 (dBm)		

RACH-ConfigCommon-DEFAULT: (FDD/TDD) for E-UTRAN random access

Table H.2.6-2: *RACH-ConfigCommon-DEFAULT*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {}	Not present		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo SEQUENCE {			Cat-M1 UE
preambleTransMax	n6		
}			
maxHARQ-Msg3Tx	4		
}			
RAR-HoppingConfigInfo-r13 [1] SEQUENCE {			
rar-HoppingConfig	off		
}			

PDSCH-ConfigCommon-DEFAULT: (FDD/TDD) for E-UTRAN random access

Table H.2.6-3: *PDSCH-ConfigCommon-DEFAULT*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5 PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

H.2.7 System information blocks message contents exceptions for eICIC/feICIC

SystemInformationBlockType2: (FDD/TDD) for eICIC/feICIC

Table H.2.7-1: *SystemInformationBlockType2*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		
}			

SystemInformationBlockType3: (FDD) for eICIC/feICIC

Table H.2.7-2: *SystemInformationBlockType3*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell

H.2.8 System information blocks message contents exceptions for eMTC

SystemInformationBlockType1-BR-r13: (FDD/TDD) for eMTC.

Table H.2.8-1: *SystemInformationBlockType1-BR-r13*

Derivation Path: 36.508 clause 4.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
freqHoppingParametersDL-r13 SEQUENCE {			
mpdcch-pdsch-HoppingNB-r13	nb2	2 narrowbands	
interval-DLHoppingConfigCommonModeA-r13 CHOICE {			
interval-FDD-r13	int4		FDD
interval-TDD-r13	Int10		TDD
}			
interval-DLHoppingConfigCommonModeB-r13 CHOICE {			
interval-FDD-r13	int8		FDD
interval-TDD-r13	int20		TDD
}			
mpdcch-pdsch-HoppingOffset-r13	7	INTEGER (1..16 (maxAvailNarrowBands-r13))	
}			
}			
}			
}			
}			
}			
}			

H.2.9 System information blocks message contents exceptions for HD-FDD radio link monitoring (RLM) for UE Category NB1

SystemInformationBlockType2-NB: for HD-FDD Radio Link Monitoring test for out-of-sync for UE category NB1

Table H.2.9-1: *SystemInformationBlockType2-NB*: HD-FDD Radio Link Monitoring test for out-of-sync for UE category NB1

Derivation Path: 36.331 clause 8.1.4.3.3, Table 8.1.4.3.3-1 SystemInformationBlockType2-NB1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2-NB-r13 ::= SEQUENCE {			
ue-TimersAndConstants-r13 SEQUENCE {			
t310-r13	ms0		
n310-r13	n1		
t311-r13	ms1000		
n311-r13	n1		
}			
}			

SystemInformationBlockType2-NB: for HD-FDD Radio Link Monitoring test for in-sync for UE category NB1

Table H.2.9-2: *SystemInformationBlockType2-NB*: HD-FDD Radio Link Monitoring test for in-sync for UE category NB1

Derivation Path: 36.331 clause 8.1.4.3.3, Table 8.1.4.3.3-1 SystemInformationBlockType2-NB1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2-NB-r13 ::= SEQUENCE {			
ue-TimersAndConstants-r13 SEQUENCE {			
t310-r13	Ms4000		
n310-r13	n1		
t311-r13	ms1000		
n311-r13	n1		
}			
}			

H.3 Default RRC messages and information elements contents exceptions

This clause contains the default values of common sRRC messages and information elements, other than those described in TS 36.508 [7].

H.3.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN Measurement Configuration

Table H.3.1-1: *RRCConnectionReconfiguration*: E-UTRAN Measurement Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
}			
}			
}			
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for intra frequency measurement

Table H.3.1-2: *MeasConfig-DEFAULT*: E-UTRAN intra frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table H.3.1-2a: *MeasConfig-DEFAULT*: E-UTRAN intra frequency measurement configuration for Cat-M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for inter frequency handover

Table H.3.1-3: *MeasConfig-DEFAULT*: E-UTRAN inter frequency measurement configuration for inter frequency handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to UTRAN cell search

Table H.3.1-4: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to UTRAN handover

Table H.3.1-5: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to GSM handover

Table H.3.1-6: *MeasConfig-DEFAULT*: interRAT GSM measurement configuration for E-UTRAN to GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

QuantityConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for L3 filtering is not used

Table H.3.1-7: QuantityConfig-DEFAULT: measurement configuration for L3 filtering is not used

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigUTRA SEQUENCE {}	Not present		
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-FDD	cpich-EcN0		
measQuantityUTRA-TDD	pccpch-RSCP		
filterCoefficient	fc0		
}			
quantityConfigGERAN SEQUENCE {}	Not present		
quantityConfigGERAN SEQUENCE {			GERAN
measQuantityGERAN	rssi		
filterCoefficient	fc0		
}			
quantityConfigCDMA2000 SEQUENCE {}	Not present		
quantityConfigCDMA2000 SEQUENCE {			CDMA2000
measQuantityCDMA2000	pilotStrength		
}			
}			

Condition	**Explanation**
UTRAN	For inter-RAT measurements with UTRAN
GERAN	For inter-RAT measurements with GERAN
CDMA2000	For inter-RAT measurements with CDMA2000

Table H.3.1-8: *MeasConfig-DEFAULT*: interRAT HRPD measurement configuration for E-UTRAN to HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for inter frequency measurement

Table H.3.1-9: *MeasConfig-DEFAULT*: E-UTRAN inter frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to GSM cell search

Table H.3.1-10: *MeasConfig-DEFAULT*: interRAT GSM measurement configuration for E-UTRAN to GSM cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	7 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f3)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f4)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f5)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			

measObjectGERAN	MeasObjectGERAN-GENERIC(f6)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f7)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement periodical configuration for E-UTRAN to GSM cell search

Table H.3.1-11: *MeasConfig-DEFAULT*: interRAT GSM measurement periodical configuration for E-UTRAN to GSM cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	7 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f3)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f4)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f5)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN Cell)	

measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f6)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f7)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

H.3.2 RRC messages and information elements contents exceptions for E-UTRAN cell re-selection and handover

PRACH-Config-DEFAULT: (FDD) for cell re-selection and handover

Table H.3.2-1: *PRACH-Config-DEFAULT*: E-UTRAN FDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		

PRACH-Config-DEFAULT: (TDD) for cell re-selection and intra frequency / inter frequency handover

Table H.3.2-2: *PRACH-Config-DEFAULT*: E-UTRAN TDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		

RRCConnectionReconfiguration: (FDD/TDD) for intra-frequency / inter-frequency handover

Table H.3.2-3: *RRCConnectionReconfiguration*: E-UTRAN handover Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
mobilityControlInfo			
}	MobilityControlInfo-HO		HO
}			
}			
}			

H.3.3 RRC messages and information elements contents exceptions for E-UTRAN inter-RAT handover

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - UTRAN handover

Table H.3.3-1: *Handover*: Inter-RAT E-UTRAN - UTRAN handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	utra	ENUMERATED {utra, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	
targetRAT-MessageContainer		OCTET STRING	
nas-SecurityParamFromEUTRA		OCTET STRING(SIZE (1))	UTRAGERAN
}			

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - GSM handover

Table H.3.3-2: *Handover*: Inter-RAT E-UTRAN - GSM handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	geran	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	
targetRAT-MessageContainer		OCTET STRING	
nas-SecurityParamFromEUTRA		OCTET STRING(SIZE (1))	UTRAGERAN
}			

MobilityFromEUTRACommand: (FDD/TDD) to setup Inter-RAT E-UTRAN handover

Table H.3.3-3: *MobilityFromEUTRACommand*: Inter-RAT E-UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-6 MobilityFromEUTRACommand			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
mobilityFromEUTRACommand-r8 SEQUENCE {			
csFallbackIndicator	FALSE		
purpose CHOICE {			
Handover	Handover		
}			
nonCriticalExtension SEQUENCE {}	Not present		
nonCriticalExtension SEQUENCE {			GERAN
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {			
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			
}			
}			

Condition	Explanation
GERAN	The field should be present if the *purpose* is set to "*handover*" and the *targetRAT-Type* is set to "*geran*"; otherwise the field is not present

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN – HRPD handover

Table H.3.3-4: *Handover*: Inter-RAT E-UTRAN – HRPD handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	cdma2000-HRPD	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

H.3.4 RRC messages and information elements exceptions for E-UTRAN UE transmit timing accuracy and UE timing advance adjustment accuracy

RRCConnectionReconfiguration: (FDD/TDD) to establish E-UTRAN Radio Resource Configuration

Table H.3.4-1: *RRCConnectionReconfiguration*: E-UTRAN Radio Resource Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated			
	RadioResourceConfigDedicated-HO-TO-EUTRA(n,m)		HO-TO-EUTRA(n,m)

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) for E-UTRAN Physical Configuration

Table H.3.4-2: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN Physical Configuration

Derivation Path: TS 36.508 [7] clause 4.8.21.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated			SRB1
	SoundingRS-UL-ConfigDedicated-DEFAULT		RBC
antennaInformation CHOICE {			
defaultValue	NULL		
}			
schedulingRequestConfig	Not present		SRB1
	SchedulingRequest-Config-DEFAULT		SRB1 AND (CEModeA OR CEModeB)

H.3.5 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN intra frequency RSRP and RSRQ accuracy

Table H.3.5-1: *MeasConfig-DEFAULT*: E-UTRAN intra frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table H.3.5-1a: *MeasConfig-DEFAULT*: E-UTRAN intra frequency RSRP and RSRQ Accuracy for Cat-M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) perform Measurement Configuration for E-UTRAN inter frequency RSRP and RSRQ accuracy

Table H.3.5-2: *MeasConfig-DEFAULT*: E-UTRAN inter frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell (inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy

Table H.3.5-3: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

Table H.3.5-3a: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy

Table H.3.5-4: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrq		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy

Table H.3.5-4a: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrq		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

MeasObjectEUTRA-GENERIC(Freq): (FDD/TDD) for eICIC/feICIC (Non-MBSFN ABS)

Table H.3.5-5: *MeasObjectEUTRA-GENERIC*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell
}			

H.3.6 RRC messages and information elements contents exceptions for E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_S

Table H.3.6-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_S

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf100		
drx-RetransmissionTimer	psf16		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for best-effort services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
}			

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_L

Table H.3.6-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_L

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_L
Setup SEQUENCE {			
onDurationTimer	psf6		
drx-InactivityTimer	psf1920		
drx-RetransmissionTimer	psf16		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
}			

H.3.7 RRC messages and information elements contents exceptions for E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX is used

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 40 ms

Table H.3.7-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency cell search and E-UTRAN intra frequency cell search when DRX = 40 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Table H.3.7-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search

Table H.3.7-3: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

H.3.8 RRC messages and information elements contents exceptions for E-UTRAN CSI-RSRP Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN intra frequency CSI-RSRP

Table H.3.8-1: *MeasConfig-DEFAULT*: E-UTRAN intra frequency CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN inter frequency CSI-RSRP

Table H.3.8-2: *MeasConfig-DEFAULT*: E-UTRAN inter frequency CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell (inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2) using condition DS_Meas	Inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entries		
measIdToAddMod[0] SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod[1] SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN Carrier Aggregation CSI-RSRP

Table H.3.8-3: *MeasConfig-DEFAULT*: E-UTRAN Carrier Aggregation CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2) using condition DS_Meas		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entries		
measIdToAddMod[0] SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod[1] SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL-CSI-RS: (FDD/TDD) for periodical configuration reporting of E-UTRAN CSI-RSRP accuracy

Table H.3.8-4: *ReportConfigEUTRA-PERIODICAL-CSI-RS*: E-UTRAN CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-12 ReportConfigEUTRA-PERIODICAL-CSI-RS			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024		
reportAmount	infinity		
si-RequestForHO-r9	Not Present		
ue-RxTxTimeDiffPeriodical-r9	Not Present		
includeLocationInfo-r10	Not Present		
reportAddNeighMeas-r10	Not Present		
alternativeTimeToTrigger-r12	Not Present		
useT312-r12	Not Present		
usePSCell-r12	Not Present		
aN-Threshold1-v1250	Not Present		
a5-Threshold2-v1250	Not Present		
reportStrongestCSI-RSs-r12	true		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

QuantityConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN CSI-RSRP accuracy

Table H.3.8-5: QuantityConfig-DEFAULT: measurement configuration for E-UTRAN CSI-RSRP accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

MeasGapConfig-GP1 (FDD/TDD) E-UTRAN measurement gap configuration for E-UTRAN CSI-RSRP accuracy

Table H.3.8-6: MeasGapConfig-GP1: measurement configuration for E-UTRAN CSI-RSRP accuracy

Derivation Path: 36.508 [7] clause 4.6.6, Table 4.6.6-1A: MeasGapConfig-GP1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig-GP1 ::= CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp0	9	TGRP = 40 ms	
}			
}			
}			

H.3.9 RRC messages and information elements contents exceptions for RSSI Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN FS3 RSSI measurements

Table H.3.9-1: *MeasConfig-DEFAULT*: E-UTRAN FS3 RSSI Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f2	f2 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP2		
}			

ReportConfigEUTRA-PERIODICAL-RSSI: (FDD/TDD) for periodical configuration reporting of E-UTRAN FS3 RSSI accuracy

Table H.3.9-2: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSSI Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
reportInterval	ms120		
reportAmount	infinity		
measRSSI-ReportConfig-r13 ::= SEQUENCE {	Present		
channelOccupancyThreshold-r13	RSSI_38		ChannelOccupancy
}			
}			

Condition	Explanation
ChannelOccupancy	For Channel Occupancy tests

MeasObjectEUTRA-GENERIC (FDD/TDD) E-UTRAN measurement object configuration for FS3 RSSI measurements

Table H.3.9-3: MeasObjectEUTRA-GENERIC: measurement configuration for E-UTRAN FS3 RSSI

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
..measDS-Config-r12 {			
….setup ::= SEQUENCE {			
dmtc-PeriodOffset-r12	ms40-r12		
}			
}			
rmtc-Config-r13 ::= CHOICE {			
….setup ::= SEQUENCE {			
rmtc-Period-r13	ms40		
rmtc-SubframeOffset-r13	20		
measDuration-r13	sym14		
}			
}			
}			

H.4 Default RRC messages and information elements contents exceptions for Carrier Aggregation

This clause contains the default values of common RRC messages and information elements for Carrier Aggregation, other than those described in TS 36.508 [7].

H.4.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for CA

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN Measurement Configuration for CA

Table H.4.1-1: *Void*

MeasConfig-DEFAULT: (FDD/TDD) E-UTRAN Measurement Configuration for Event Triggered Reporting for CA

Table H.4.1-2: *MeasConfig-DEFAULT*: E-UTRAN Measurement Configuration for CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)and neighbouring cell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasObjectEUTRA-GENERIC: (FDD/TDD) E-UTRAN Measurement Configuration for Event Triggered Reporting for CA

Table H.4.1-3: *MeasObjectEUTRA-GENERIC(Freq)*: E-UTRAN Measurement Configuration for CA with SCell measurement cycle 1280 ms)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighbourCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)	MBSFN doesn't apply by default.	TDD
	10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cell)		FDD
offsetFreq	0 (dB 0)		
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
measCycleSCell-r10	sf1280		
measSubframePatternConfigNeigh-r10	Not present		
}			

Table H.4.1-4: Void

MeasurementReport: (FDD/TDD) E-UTRAN Measurement Report for CA and DC

Table H.4.1-5: MeasurementReport: E-UTRAN Measurement Report for CA and DC

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table H.4.1-5a: MeasurementReport: E-UTRAN Measurement Report for CA and DC without Neigh Cells

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

ReportConfigEUTRA-A6: (FDD/TDD) E-UTRAN Measurement Report Configuration for Event A6 for CA

Table H.4.1-6: ReportConfig-A6: E-UTRAN Report config for Event A6 for CA

Derivation Path: TS 36.508 [7] clause 4.6.6 table 4.6.6-6A			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A6 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA6-r10 SEQUENCE {			
a6-Offset-r10	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	A6-Offset = -3dB
	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	A6-Offset = -6dB
a6-ReportOnLeave-r10	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms5120		
reportAmount	r1		
}			

MeasurementReport: (FDD/TDD) E-UTRAN RSRP Measurement Report for CA (≥ 3DL CA)

Table H.4.1-7: MeasurementReport: E-UTRAN RSRP Measurement Report for CA (≥ 3DL CA)

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour cell	
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasResultServFreq-r10[n] {			
servFreqId-r10	n	n denotes the index of the entry. n=1,2,…N	
measResultSCell-r10 SEQUENCE {		SCell Cell (2*n)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

MeasurementReport: (FDD/TDD) E-UTRAN RSRQ Measurement Report for CA (≥ 3DL CA)

Table H.4.1-8: MeasurementReport: E-UTRAN RSRQ Measurement Report for CA (≥ 3DL CA)

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasResultServFreq-r10[n] {			
servFreqId-r10	n		
measResultSCell-r10 SEQUENCE {		SCell Cell (n+1)	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

H.4.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for CA

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN RSRP and RSRQ accuracy for CA

Table H.4.2-1: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency	

		of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC (Cell 3)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC (Cell 3)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy for CA

Table H.4.2-2: Void

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy for CA

Table H.4.2-3: Void

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP and RSRQ accuracy for CA

Table H.4.2-4: Void

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy for CA (≥ 3DL CA)

Table H.4.2-5: *MeasConfig-DEFAULT*: E-UTRAN RSRP Accuracy for CA (≥ 3DL CA)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasObjectToAddMod[n] SEQUENCE {			
measObjectId	IdMeasObject-f(n)	f(n), n=1,2,…N is the frequency of the PCell and Scells according to Annex E	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f(n))		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
measIdToAddMod ::= SEQUENCE {			
measId	n	n denotes the index of the entry. n=1,2,…N	
measObjectId	IdMeasObject-f(n)		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy for CA (≥ 3DL CA)

Table H.4.2-6: *MeasConfig-DEFAULT*: E-UTRAN RSRQ Accuracy for CA (≥ 3DL CA)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasObjectToAddMod[n] SEQUENCE {			
measObjectId	IdMeasObject-f(n)	f(n) , n=1,2,…N is the frequency of the PCell and Scells according to Annex E	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f(n))		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entries		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f(1)		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

H.5 Default RRC messages and information elements contents exceptions for FeICIC

This clause contains the default values of common RRC messages and information elements for FeICIC, other than those described in TS 36.508 [7].

H.5.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for FeICIC

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for NeighCells-Info-r11

Table H.5.1-1: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: NeighCellsCRS-Info

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellsCRS-Info-r11 ::= CHOICE {			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup	CRS-AssistanceInfoList-r11		
}			
}			

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for CRS-AssistancecInfoList-r11

Table H.5.1-2: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: CRS-AssistanceInfoList-r11

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11			
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1} - PCI_{cell3})mod6 = 0 (PCI_{cell2} - PCI_{cell3})mod6 != 0	Cell PCIs are selected so that both conditions are met	
antennaPortsCount-r11	an1		
mbsfn-SubframeConfigList-r11	MBSFN-SubframeConfigList		
}			

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for MBSFN-SubframeConfigList

Table H.5.1-3: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: MBSFN-SubframeConfigList

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
MBSFN-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	Only the CRS information of Cell 2 is provided in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *oneFrame*='000000' BIT STRING (SIZE(6))	
}			
}			

H.5.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for FeICIC

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP and RSRQ accuracy for FeICIC

Table H.5.2-1: *MeasurementReport*: E-UTRAN RSRP and RSRQ Accuracy for FeICIC

Derivation path: TS 36.508 [7] clause 4.6.1 Table 4.6.1-5 MeasurementReport			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of best Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of 2nd best Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			

}			
}			

H.6 Default RRC messages and information elements contents exceptions for Proximity based services

This clause contains the default values of common RRC messages and information elements for Proximity based services, other than those described in TS 36.508 [7].

H.6.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for Proximity based services

H.6.1.1 Reference resource pool configurations for ProSe Direct Discovery

Table H.6.1.1-1: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #1)

Information Element				Value
discRxPool	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		12
		prb-Start		0
		prb-End		23
		offsetIndicator		160
		subframeBitmap		11000000 00000000 00000000 00000000 00000000
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		2
		prb-Start		3
		prb-End		5
		offsetIndicator		160
		subframeBitmap		10000000 00000000 00000000 00000000 00000000
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		ue-SelectedResourceConfig	poolSelection	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	discMaxTxPower			23
SL-SyncConfig	syncCP-Len			Normal
	syncOffsetIndicator			155
	slssid			30
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

Table H.6.1.1-2: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #2)

Information Element				Value
discRxPool	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		12
		prb-Start		0
		prb-End		23
		offsetIndicator		160
		subframeBitmap		11000000 00000000 00000000 00000000 00000000
	txParameters			not present
	rxParameters	*tdd-Config*		not present
		syncConfigIndex		0
discTxPoolCommon				not present
discTxPowerInfo	*discMaxTxPower*			23
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			140
	slssid			30
	txParameters			not present
	rxParamsNCell	*physCellId*		1
		discSyncWindow		w1
discInterFreqLis				not present

Table H.6.1.1-3: ProSe Direct Discovery configuration for E-UTRA TDD Config 0 (Configuration #3)

Information Element				Value
discRxPool	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		12
		prb-Start		0
		prb-End		23
		offsetIndicator		163
		subframeBitmap		11000000 00000000 00000000 00000000 00000000 00
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		2
		prb-Start		3
		prb-End		5
		offsetIndicator		163
		subframeBitmap		10000000 00000000 00000000 00000000 00000000 00
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		ue-SelectedResourceConfig	*poolSelection*	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	*discMaxTxPower*			23
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			158
	slssid			30
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

H.6.1.2 Reference resource pool configurations for ProSe Direct Communication

Table H.6.1.2-1: ProSe Direct Communication configuration for E-UTRA FDD (Configuration #1)

Information Element				Value (5MHz)	Value (10MHz)
commRxPool	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	
	rxParametersNCell			not present	
	txParameters			not present	
commTxPoolNormalCommon	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		24	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	
	rxParametersNCell			not present	
	txParameters	*sc-TxParameters*	*alpha*	al0	
			p0	31	
		dataTxParameters	*alpha*	al0	

			p0	31
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			2
	slssid			30
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present

Table H.6.1.2-2: ProSe Direct Communication pre-configuration for E-UTRAN FDD for out-of-network coverage operation (Configuration #2)

Information Element				**Value (5MHz)**	**Value (10MHz)**
preconfigSync	*syncCP-Len-r12*			Normal	
	syncOffsetIndicator1			2	
	syncOffsetIndicator2			1	
	syncTxParameters			31	
	syncTxThreshOoC			0 (-110dBm / 15kHz)	
	filterCoefficient			fc0	
	syncRefMinHyst			dB0	
	syncRefDiffHyst			dB0	
preconfigComm	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	

H.7 Default RRC messages and information elements contents exceptions for eMTC

This clause contains the default values of common RRC messages and information elements for eMTC, other than those described in TS 36.508 [7].

H.7.1 RRC messages and information elements contents exceptions for eMTC

EPDCCH-Config-r11-DEFAULT for eMTC.

Table H.7.1-1: EPDCCH-Config-r11-DEFAULT

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
EPDCCH-Config-r11 ::= SEQUENCE{			
config-r11{			
setup SEQUENCE {			
setConfigToAddModList-r11 SEQUENCE {	1 entry		
mpdcch-config-r13 CHOICE[1] {			
setup SEQUENCE {			
mpdcch-pdsch-HoppingConfig-r13	on		CEfreqHopp
}			
}			
}			
}			
}			
}			

Condition	Explanation
CEfreqHopp	Used when frequency hopping is used in CE test cases

PUCCH-Config-Common-v1310-DEFAULT for eMTC

Table H.7.1-2: PUCCH-ConfigCommon-v1310-DEFAULT

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PUCCH-ConfigCommon-v1310-DEFAULT ::= SEQUENCE {			
n1PUCCH-AN-InfoList-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF INTEGER (0..2047)	4 entries		CEmodeA
n1PUCCH-AN-InfoList-r13[1]	2		
n1PUCCH-AN-InfoList-r13[2]	2		
n1PUCCH-AN-InfoList-r13[3]	2		
n1PUCCH-AN-InfoList-r13[4]	2		
}			

Annex I (normative): Conditions for RRM requirements applicability for operating bands

I.1 Conditions for E-UTRAN RRC_IDLE state mobility

I.1.1 Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

This section defines the E-UTRAN intra-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection are defined in Table I.1.1-1

Table I.1.1-1: Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-124	-124	≥ -4	≥ -4
	FDD_B	-123.5	-123.5		
	FDD_C, TDD_C	-123	-123		
	FDD_D	-122.5	-122.5		
	FDD_E, TDD_E	-122	-122		
	FDD_F	-121.5 Note 2	-121.5 Note 2		
	FDD_G	-121	-121		
	FDD_H	-120.5	-120.5		
	FDD_N	-117.5	-117.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Section I.4.2.
NOTE 2: The condition is -122 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.1.2 Conditions for measurements of inter-frequency E-UTRAN cells for cell re-selection

This section defines the E-UTRAN inter-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection defined in Table I.1.1-1 also apply for inter-frequency E-UTRAN cells in this section.

I.1.3

I.1.4 Conditions for measurements of intra-frequency NB-IoT cells for cell re-selection for UE Category NB1

This clause defines the NB-IoT intra-frequency NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.1.4 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection are defined in Table I.1.4-1 and I.1.4-3.

The conditions for measurements of intra-frequency NB-IoT cells in enhanced coverage for cell re-selection are defined in Table I.1.4-2 and I.1.4-4.

Table I.1.4-1: NB-IoT intra-frequency measurements for HD-FDD in normal coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRSRP Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NFDD_G	-121	-121	≥ -6	≥ -6
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

Table I.1.4-2: NB-IoT intra-frequency measurements for HD-FDD in enhanced coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRSRP Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NFDD_G	-121	-121	≥ -15	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

Table I.1.4-3: NB-IoT intra-frequency measurements for TDD in normal coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRS Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NTDD_G	-129	-129	≥ -6	≥ -6
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

Table I.1.4-4: NB-IoT intra-frequency measurements for TDD in enhanced coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRS Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NTDD_G	-138	-138	≥ -15	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

I.1.5 Conditions for measurements of inter-frequency NB-IoT cells for cell re-selection for UE Category NB1

This clause defines the NB-IoT inter-frequency NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.1.5 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection defined in Table I.1.4-1 and I.1.4-3 also apply for inter-frequency NB-IoT cells in normal coverage in this section.

The conditions for measurements of intra-frequency NB-IoT cells in enhanced coverage for cell re-selection defined in Table I.1.4-2 and I.1.4-4 also apply for inter-frequency NB-IoT cells in enhanced coverage in this section.

I.2 Conditions for UE Measurements Procedures in RRC_CONNECTED State

I.2.1 Conditions for E-UTRAN intra-frequency measurements

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band

The conditions for intra-frequency E-UTRAN measurements are defined in Table I.2.1-1

Table I.2.1-1: E-UTRAN intra-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -6
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2.			
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.			
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.			

I.2.2 Conditions for E-UTRAN intra-frequency measurements with autonomous gaps

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band

The conditions for intra-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.1-1

Table I.2.2-1: Void

I.2.3 Conditions for E-UTRAN inter-frequency measurements

This section defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP and RSRP Ês/Iot applicable for a corresponding operating band

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.3-1

Table I.2.3-1: E-UTRAN inter-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ -4	≥ -4
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.					

I.2.4 Conditions for E-UTRAN inter-frequency measurements with autonomous gaps

This section defines the E-UTRAN inter-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.4-1.

Table I.2.4-1: E-UTRAN inter-frequency measurements with autonomous gaps

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-125	≥ -4
	FDD_B	-124.5	
	FDD_C, TDD_C	-124	
	FDD_D	-123.5	
	FDD_E, TDD_E	-123	
	FDD_F	-122.5 Note 2	
	FDD_G	-122	
	FDD_H	-121.5	
	FDD_N	-118.5	
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.			

I.2.5 Void

I.2.6 Void

I.2.7 Conditions for Measurements of the secondary component carrier with deactivated SCell

This section defines the SCH_RP and SCH Ês/Iot for measurements in the secondary component carrier applicable for a corresponding operating band

The conditions for measurements of the secondary component carrier with deactivated SCell are defined in Table I.2.7-1.

Table I.2.7-1: Measurements of the secondary component carrier with deactivated SCell

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -6
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.8 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction are defined in Table I.2.8-1.

Table I.2.8-1 E-UTRAN intra-frequency measurements under time domain measurement resource restriction

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -7.5
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.9 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction with CRS assistance information are defined in Table I.2.9-1.

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1 dBm/15kHz	SCH Ês/Iot dB
Conditions	FDD_A, TDD_A	-127	≥ -11.07
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table I.2.9-1: E-UTRAN intra-frequency measurements under time domain measurement resource restriction with CRS assistance information

I.2.10 Conditions for E-UTRAN intra-frequency discovery signal measurements

This clause defines the E-UTRAN intra-frequency SCH_RP, SCH Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for discovery signal measurements

The conditions for E-UTRAN intra-frequency discovery signal measurements are as in Table I.2.1-1.

I.2.11 Conditions for E-UTRAN inter-frequency discovery signal measurements

I.2.11.1 Conditions for E-UTRAN inter-frequency CRS-based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP, and Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table I.2.11.1-1.

Table I.2.11.1-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ -6	≥ -6
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.11.2 Conditions for E-UTRAN inter-frequency CSI-RS based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, CSI-RSRP, and CSI-RS Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table I.2.11.2-1.

Table I.2.11.2-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP Note 1	Minimum SCH_RP Note 1	CSI-RS Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ 0	≥ -6
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.12 to I.2.14

I.2.15 Conditions for NB-IoT intra-frequency measurements by UE Category NB1

This clause defines the NB-IoT intra-frequency NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.2.15 is defined in TS36.133 [4] Section 3.6.

The conditions for intra-frequency measurements in normal coverage are defined in Table I.2.15-1 and I.2.15-3.

The conditions for intra-frequency measurements in enhanced coverage are defined in Table I.2.15-2 and I.2.15-4.

Table I.2.15-1: NB-IoT intra-frequency measurements for HD-FDD in normal coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	NSCH Ês/Iot
		dBm/15kHz	dB
Conditions	NFDD_G	-124	≥ -6

NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.

Table I.2.15-2: NB-IoT intra-frequency measurements for HD-FDD in enhanced coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	NFDD_G	-124	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.			

Table I.2.15-3: NB-IoT intra-frequency measurements for TDD in normal coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	NSCH Ês/Iot
		dBm/15kHz	dB
Conditions	NTDD_G	-129	≥ -6
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.			

Table I.2.15-4: NB-IoT intra-frequency measurements for TDD in enhanced coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	NTDD_G	-138	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.			

I.2.16 Conditions for NB-IoT intra-frequency RSTD measurements by UE Category NB1

This clause defines the NB-IoT intra-frequency PRP1,2 applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.2.16 is defined in Section 3.1.

The conditions for intra-frequency RSTD measurements in normal coverage are defined in Table I.2.16-1 and I.2.16-3.

The conditions for intra-frequency RSTD measurements in enhanced coverage are defined in Table I.2.16-2 and I.2.16-4.

Table I.2.16-1: NB-IoT intra-frequency RSTD measurements for HD-FDD in normal coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NFDD_G	-129
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.16-2: NB-IoT intra-frequency RSTD measurements for HD-FDD in enhanced coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NFDD_G	-135
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.16-3: NB-IoT intra-frequency RSTD measurements for TDD in normal coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NTDD_G	-129
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.16-4: NB-IoT intra-frequency RSTD measurements for TDD in enhanced coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NTDD_G	-135
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

I.2.17 Conditions for NB-IoT inter-frequency RSTD measurements by UE Category NB1

This clause defines the NB-IoT inter-frequency PRP1,2 applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.2.17 is defined in Section 3.1.

The conditions for intra-frequency RSTD measurements in normal coverage are defined in Table I.2.17-1 and I.2.17-3.

The conditions for intra-frequency RSTD measurements in enhanced coverage are defined in Table I.2.17-2 and I.2.17-4.

Table I.2.17-1: NB-IoT inter-frequency RSTD measurements for HD-FDD in normal coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NFDD_G	-129
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.17-2: NB-IoT inter-frequency RSTD measurements for HD-FDD in enhanced coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NFDD_G	-135
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.17-3: NB-IoT inter-frequency RSTD measurements for TDD in normal coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NTDD_G	-129
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

Table I.2.17-4: NB-IoT inter-frequency RSTD measurements for TDD in enhanced coverrage

Parameter	E-UTRA operating band groups Note 1	Minimum PRP1,2 Note 1
		dBm/15kHz
Conditions	NTDD_G	-135
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5		

I.3 Conditions for measurements performance requirements for UE

I.3.1 Conditions for intra-frequency RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table I.3.1-1.

Table I.3.1-1: Intra-frequency absolute RSRP and RSRQ Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.2 Void

I.3.3 Conditions for inter-frequency RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN inter-frequency RSRP applicable for a corresponding operating band.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table I.3.1-1.

I.3.4 Conditions for inter-frequency relative RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN inter-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for inter-frequency relative RSRP and RSRQ accuracy requirements are defined in Table I.3.8-1.

I.3.5 to I.3.7Void

I.3.8 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements

This section defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements are specified in Table I.3.8-1.

Table I.3.8-1 Intra-frequency relative RSRP accuracy requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP1,2 Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.9 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction are as specified in Table I.3.1-1.

I.3.10 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction are defined in Table I.3.8-1.

I.3.11 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table I.3.1-1.

I.3.12 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table I.3.8-1.

I.3.13 Void

I.3.14 Conditions for Intra-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

I.3.14.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.1-1

I.3.14.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table I.3.14.2-1

Table I.3.14.2-1: Intra-frequency Absolute CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.3.15 Conditions for Intra-Frequency Relative Discovery Signal Measurement Accuracy Requirements

I.3.15.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency relative RSRP accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.8-1.

I.3.15.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table I.3.15.2-1.

Table I.3.15.2-1: Intra-frequency Relative CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP1,2 Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.3.16 Conditions for Inter-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

I.3.16.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.1-1.

I.3.16.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table I.3.14.2-1.

I.3.17 Conditions for Inter-Frequency Relative Discovery Signal Measurement Accuracy Requirements

I.3.17.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency relative RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.8-1.

I.3.17.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table I.3.15.2-1.

I.3.18 to I.3.24

I.3.25 Conditions for NB-IoT intra-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1

This clause defines the NB-IoT intra-frequency NRSRP applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.3.25 is defined in TS36.133 [4] Section 3.6.

The conditions for intra-frequency absolute NRSRP and NRSRQ accuracy requirements are defined in Table I.3.25-1.

Table I.3.25-1: NB-IoT intra-frequency absolute NRSRP and NRSRQ Accuracy Requirements

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP
		dBm/15kHz
Conditions	NFDD_G, NTDD_G	-139.8
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.26 Conditions for NB-IoT inter-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1

This clause defines the NB-IoT inter-frequency NRSRP applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.3.26 is defined in TS36.133 [4] Section 3.6.

The conditions for inter-frequency absolute NRSRP and NRSRQ accuracy requirements are defined in Table I.3.25-1.

I.4 RRM Requirements Exceptions

I.4.1 General

I.4.2 Receiver sensitivity relaxation for UE supporting CA

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c}$>0 dB as defined in TS 36.101 [2], Table 7.3.1-1A, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta=\Delta R_{IB,c}$ defined for each of the downlink E-UTRA bands.

NOTE: This side condition adjustment applies only for a UE supporting a single inter-band LTE CA band combination. For a UE supporting additional inter-band LTE CA band combinations, the $\Delta R_{IB,c}$ for all bands supported by the UE, need to be studied TS 36.101 [2].

I.4.3 Receiver sensitivity relaxation for UE configured with CA

I.4.3.1 Inter-band carrier aggregation

In this section, requirements exceptions are described for the UE configured with inter-band carrier aggregation with one uplink active in low operating band.

A relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement shall be increased by the amount Δ=L2-L1, where L1 is the reference sensitivity level specified in TS 36.101 [2], Table 7.3.1-1, and L2 is the reference sensitivity level specified in TS 36.101 [2], Table 7.3.1A-0a, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the low operating band,
- the exception requirements specified in TS 36.101 [2], Table 7.3.1A-0a, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section I.4.2 should not be applied.

I.4.3.2 Intra-band non-contiguous carrier aggregation

For a UE configured with intra-band non-contiguous carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity ΔR_{IBNC}>0 as defined in TS 36.101 [2], Table 7.3.1A-3, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta=\Delta R_{IBNC}$ defined for the downlink SCC, when the following conditions are fulfilled,

- both downlink component carriers are configured with CA and active,
- one uplink carrier is active,
- the exception requirements specified in TS36.101 [2], Table 7.3.1A-3, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section I.4.2 should not be applied.

I.4.3.3 Inter-band carrier aggregation with operating bands without uplink band

In this section, requirements are described for the UE configured with inter-band carrier aggregation involving one operating band without uplink band.

There is no relaxation in relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement, i.e., Δ=0, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the high operating band,
- conditions specified in TS36.101 [2], Table 7.3.1A-0d, apply.

If Δ specified in this section applies, then no other additional relaxation to REFSENS shall be applied.

I.5 Void

I.6 Conditions for V2X

I.6.1 Void

I.6.2 Conditions for Absolute S-RSRP Accuracy Requirements

This clause defines the S-RSRP applicable for a corresponding operating band.

The conditions for absolute S-RSRP accuracy requirements are defined in Table I.6.2-1.

Table I.6.2-1: Absolute S-RSRP Requirements

Parameter	E-UTRA V2X operating band groups Note2	Minimum S-RSRP Note 1
		dBm/15kHz
	TDD_G	-124
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: E-UTRA V2X operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.		

I.6.3 Conditions for Relative S-RSRP Accuracy Requirements

This clause defines the S-RSRP1,2 applicable for a corresponding operating band.

The conditions for relative S-RSRP accuracy requirements are specified in Table I.6.3-1.

Table I.6.3-1: Relative S-RSRP accuracy requirements

Parameter	E-UTRA V2X operating band groups Note 2	Minimum S-RSRP1,2 Note 1
		dBm/15kHz
	TDD_G	-124
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: E-UTRA V2X operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.		

I.6.4 Conditions for Selection/Reselection to Intra-frequency SyncRef UE

This clause defines the V2X SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for selection/reselection to intra-frequency SyncRef UE are defined in Table I.6.4-1.

Table I.6.4-1: V2X synchronization measurements

Parameter	E-UTRA V2X operating band groups Note 2	Minimum V2X SCH_RP Note 1	V2X SCH Ês/Iot Note 3
		dBm/15kHz	dB
	TDD_G	-124	≥ -4
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: E-UTRA V2X operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands. NOTE 3: V2X SCH Ês/Iot for a SyncRef UE is the minimum of the Ês/Iot of PSSS/PSBCH and the Ês/Iot of SSSS			

I.6.5 Conditions for Absolute PSSCH-RSRP Accuracy Requirements

This clause defines the PSSCH-RSRP applicable for a corresponding operating band.

The conditions for absolute PSSCH-RSRP accuracy requirements are defined in Table I.6.5-1.

Table I.6.5-1: Absolute PSSCH-RSRP Requirements

Parameter	E-UTRA V2X operating band groups Note2	Minimum PSSCH-RSRP Note 1
		dBm/15kHz
	TDD_G	-124
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: E-UTRA V2X operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.		

I.7 Conditions for sTTI and 1ms-TTI with 3 Subframe HARQ Processing

I.7.1 Conditions for Maximum Timing Difference Between Uplink and Downlink Carriers in Carrier Aggregation

This clause defines the condition on the maximum timing difference between the earliest uplink carrier and the latest downlink carrier in carrier aggregation when a UE is configured with at least one serving cell that is configured with *dl-STTI-Length-r15* or *ShortProcessingTime =TRUE*.

The timing difference between the earliest uplink carrier and the latest downlink carrier among all the serving cells configured to the UE is no larger than

maxTd $_1$ when any of the serving cells is configured with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus4set1,

maxTd $_2$ when any of the serving cells is configured with *dl-STTI-Length-r15* =subslot and *proc-Timeline-r15*=nplus6set2,

maxTd$_3$ when any of the serving cells is configured with *ShortProcessingTime =TRUE*,

maxTd $_4$ when any of the serving cells is configured with *dl-STTI-Length-r15*=slot,

maxTd$_5$ when any of the serving cells is configured with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus6set1,

$maxTd_6$ when any of the serving cells is configured with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus8set2.

The values of the parameters $maxTd_i$ for i=1,… ,6 are as specified in Table I.7.2-1.

Table I.7.2-1: Maximum Subframe Timing Boundary Difference Between Earliest Uplink Carrier and Latest Downlink Carrier

Parameter	Value
$maxTd_1$	66.67 μs (Note 1)
$maxTd_2$	166.67 μs (Note 2)
$maxTd_3$	200.00 μs (Note 3)
$maxTd_4$	309.90 μs (Note 4)
$maxTd_5$	352.08 μs (Note 5)
$maxTd_6$	452.08 μs (Note 6)

Note 1: Maximum timing advance with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus4set1 [9]
Note 2: Maximum timing advance with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus6set2 [9]
Note 3: Maximum timing advance with *ShortProcessingTime = TRUE* [9]
Note 4: Maximum timing advance with *dl-STTI-Length-r15*=slot [9]
Note 5: Maximum timing advance with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus6set1 [9]
Note 6: Maximum timing advance with *dl-STTI-Length-r15*=subslot and *proc-Timeline-r15*=nplus8set2 [9]

Annex J (informative): Handling requirements and tests for different releases and UE capabilities

This annex gives guidance on how minimum requirements in different releases of 3GPP TS 36.133 [4] and different UE capabilities are handled in the specification 3GPP TS 36.521-3.

J.1 General considerations

Same as TS 36.521-1 [10] Annex I with the following exceptions:

- Instead of "*TS 36.101*" → use "*TS 36.133*"

- Instead of "*TS 36.521-1*" → use "*TS 36.521-3*"

- Instead of "*Annex I*" → use "*Annex J*"

J.2 Concrete scenarios

J.2.1 Tests for minimum requirements varying between releases, without introduction of new features

Same as TS 36.521-1 [10] Annex I with the following exceptions:

- Instead of "*TS 36.101*" → use "*TS 36.133*"

- Instead of "*TS 36.521-1*" → use "*TS 36.521-3*"

- Instead of "*Annex I*" → use "*Annex J*"

J.2.2 Void

Annex K (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-06	RAN5#39bis	R5-082129			R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0)		0.1.0
2008-06	*RAN5#39bis*	*R5-082174*			Following approved TPs have been included: R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0) R5-082160: Cover for LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-082161: Cover for LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-082162: Update of 36.521-1: Introduction of HRPD and CDMA2000 in RRM test cases R5-082163: Cover for LTE UE Transmit Timing Requirements text proposal Editorial changes for Annexes	*0.1.0*	*0.2.0*
2008-08	RAN5#40	R5-083164			Following approved TPs have been included: R5-083051: LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-083052: LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-083053: LTE UE Transmit Timing Requirements text proposal R5-083054: LTE UE Measurement Procedures text proposal R5-083813: LTE UE Measurement Performance Requirements text proposal R5-083138: Text proposal for LTE E-UTRAN Cell Re-selection to HRPD or to cdma2000 1xRTT in TS 36.521-3 R5-083056: RRC Connection Mobility Control text proposal R5-083164: LTE-RF 36-521-3 after RAN5#40 Editorial restructuring to section 4	0.2.0	0.3.0
2008-10	RAN5#40Bis	R5-084073			Following approved TPs have been included: R5-084073: TS 36.521-3 after RAN5#40Bis R5-084079: LTE Cell Re-Selection text proposal R5-084322: LTE FDD/FDD Handover for intra/inter frequency text proposal	0.3.0	0.4.0
2008-11	RAN5#41	R5-085084			Following approved TPs have been included: R5-085084 LTE-RF: TS 36.521-3 after RAN5#41 R5-085718 LTE RRM Cell Re-Selection text proposal R5-085719 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-085720 E-UTRAN FDD intra-frequency measurements text proposal R5-085740 RSRQ Accuracy Measurement Performance Requirements text proposal R5-085722 Text Proposal for Cell Configuration mapping annex in 36.521-3 Editor's cleanup	0.4.0	0.5.0

2009-01	RAN5#41Bis	R5-086067			Following approved TPs have been included: R5-086067 LTE-RF: TS 36.521-3 after RAN5#41Bis R5-086149 References to connection diagrams R5-086418 LTE RRM Cell Re-Selection text proposal R5-086095 Cell configuration reference correction for RRM tests in 36.521-3 section 3A.3 R5-086419 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-086420 E-UTRAN FDD intra-frequency measurements text proposal R5-086431 RSRQ Accuracy Measurement Performance Requirements text proposal R5-086082 LTE UE Transmit Timing Requirements text proposal R5-086422 Text proposal for RSRP measurement accuracy test cases R5-086432 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-086142 Measurement Reference Channels and OCNG for RRM testing R5-086150 Statistical testing in RRM tests Editor's cleanup	0.5.0	0.6.0

2009-03	RAN5#42	R5-090191			Following approved TPs have been included: R5-091026 TDD Intra frequency RSRQ Accuracy R5-091085 TDD Inter frequency RSRQ Accuracy R5-091035 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091047 E-UTRAN FDD intra-frequency measurements text proposal R5-091029 RSTQ Accuracy Measurement Performance Requirements text proposal R5-091041 LTE RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091040 LTE RRM E-UTRA FDD to GSM Handover text proposal R5-090182 LTE UE Measurement Procedures Structure text proposal R5-091048 LTE RRM E-UTRA FDD to UTRA FDD Cell Search text proposal R5-090184 LTE UE inter-RAT Handover Structure text proposal R5-091039 LTE RRM E-UTRA FDD to UTRA FDD Handover text proposal R5-091053 LTE UE Transmit Timing Requirements text proposal R5-090191 LTE-RF: TS 36.521-3 after RAN5#42 R5-091091 Intra-frequency cell search TDD R5-091088 Intra-frequency Absolute RSRP measurement accuracy TDD R5-091090 Intra-frequency Relative RSRP measurement accuracy TDD R5-091089 Inter-frequency RSRP absolute accuracy TDD R5-091087 Inter-frequency RSRP relative accuracy TDD R5-091028 Text Proposal for RSRP Measurement Accuracy test cases R5-091076 Text Proposal for Annex C of TS 36.521-3 R5-091051 TP of E-UTRAN TDD & GSM cell re-selection test case R5-091043 TP of E-UTRAN TDD & TDD inter frequency cell re-selection test case R5-091036 TP of E-UTRAN TDD & TDD inter frequency handover test case R5-091044 TP of E-UTRAN TDD - TDD intra frequency cell re-selection test case R5-091038 TP of E-UTRAN TDD & TDD intra frequency handover test case R5-091045 TP of E-UTRAN TDD & UTRAN TDD cell re-selection test case R5-091049 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-091050 E-UTRAN TDD- TDD Inter-Frequency Measurements text proposal R5-091052 LTE-RF: Update to 36.521-3 Annex E Cell Configuration mapping R5-091064 Correction to frequencies to be tested in RRM test cases R5-091042 LTE RRM Cell Re-Selection text proposal Editor's cleanup	0.6.0	1.0.0

2009-03	RAN5#42Bis				R5-091263 LTE-RRM Cell Re-Selection text proposal R5-091922 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091923 LTE-RRM E-UTRA FDD - UTRA TDD Cell Re-Selection text proposal R5-091924 TP of E-UTRA TDD - GSM cell reselection R5-091945 TP of E-UTRA TDD-UTRAN TDD cell re-selection : UTRA is of higher priority R5-091926 TP of E-UTRA TDD - UTRA TDD cell reselection: UTRA is of lower priority test case R5-091264 LTE-RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091931 LTE-RRM E-UTRA FDD to GSM Handover text proposal R5-091928 LTE-RRM E-UTRA FDD to UTRA FDD Handover text proposal R5-091946 LTE-RRM: E-UTRA TDD to UTRA FDD Handover text proposal R5-091947 LTE-RRM: Handover test proposal R5-091930 TP of E-UTRA TDD to UTRA TDD handover test case R5-091265 LTE-RRM E-UTRAN FDD intra-frequency measurements text proposal R5-091266 LTE-RRM RSRQ Accuracy Measurement Performance Requirements text proposal R5-091932 LTE-RRM E-UTRA FDD to UTRA FDD Cell Search (fading) text proposal R5-091933 LTE-RRM E-UTRAN FDD & UE Transmit Timing Accuracy text proposal R5-091276 LTE-RRM E-UTRAN FDD & UE Timing Advance Adjustment Accuracy text proposal R5-091934 LTE-RRM: E-UTRA TDD to UTRA FDD Cell Search (fading) text proposal R5-091935 LTE-RRM E-UTRAN TDD & UE Transmit Timing Accuracy text proposal R5-091936 LTE-RRM E-UTRAN TDD & UE Timing Advance Adjustment Accuracy text proposal R5-091937 LTE-RRM E-UTRA FDD to UTRA TDD Cell Search (fading) text proposal R5-091381 EUTRAN TDD to UTRAN TDD cell search (fading) R5-091386 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-091398 Text Proposal for RSRP Measurement Accuracy test cases R5-091948 LTE-RRM: Measurements test proposal R5-091431 RRM-EUTRAN FDD RLM test for out-of-sync R5-091434 RRM-EUTRAN TDD RLM test for out-of-sync R5-091435 RRM-EUTRAN FDD RLM test for In-sync R5-091436 RRM-EUTRAN TDD RLM test for In-sync R5-091468 RRM E-UTRAN FDD-FDD Inter-frequency Measurements R5-091469 RRM E-UTRAN TDD-TDD Inter-frequency Measurements R5-091939 LTE-RRM cell configuration mapping updates R5-091407 Update of statistical requirements to 36.521-3 Editor's cleanup	1.0.0	1.1.0

2009-05	RAN5#43	R5-092156			R5-092156 LTE-RF: TS 36.521-3 after RAN5#43 R5-092066 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-092617 RRM E-UTRAN TDD-TDD Inter-frequency Measurement R5-092068 RRM-EUTRAN FDD RLM test for out-of-sync and in-synch R5-092069 RRM-EUTRAN TDD RLM test for out-of-sync and in-synch R5-092071 Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas R5-092127 Update of statistical requirements to 36.521-3 R5-092630 LTE RRM: 1→2 RX antenna R5-092618 Text Proposal for E-UTRAN FDD-UTRAN FDD cell re-selection test cases R5-092651 Text Proposal for E-UTRAN FDD - GSM Measurements test case R5-092620 LTE-RRM E-UTRA TDD to GSM event triggered reporting in AWGN text proposal R5-092360 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-092621 LTE-RRM Default Message Contents for support of RRM text proposal R5-092384 LTE-RRM Update of Message Contents for E-UTRAN FDD RRM tests to align with support of RRM text proposal R5-092622 LTE-RRM E-UTRAN FDD Cell Re-Selection text proposal R5-092386 LTE-RRM FDD Inter Frequency RSRQ Accuracy Measurement Performance Requirements text proposal R5-092387 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-092623 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in long DRX text proposal R5-092624 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in short DRX text proposal R5-092390 LTE-RRM E-UTRAN FDD - UE Transmit Timing Accuracy text proposal R5-092626 LTE-RRM E-UTRAN FDD random access: contention based scenario text proposal R5-092627 LTE-RRM E-UTRAN FDD random access: non-contention based scenario text proposal R5-092628 LTE-RRM E-UTRA FDD to HRPD Handover text proposal R5-092629 LTE-RRM E-UTRA FDD to cdma2000 1xRTT Handover text proposal R5-092443 Addition of band 18 and 19 to LTE RRM test cases Editor's cleanup	1.1.0	2.0.0
2009-05	RAN#44	-	-		Updated to v8.0.0 after RAN#44 with no technical change.	2.0.0	8.0.0
2009-06	-	-	-		Editorial clean up	8.0.0	8.0.1
2009-09	RAN#45	R5-094036	0001	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN (FDD) cell re-selection tests	8.0.1	8.1.0
2009-09	RAN#45	R5-094037	0002	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Inter Frequency Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094038	0003	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Intra Frequency Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094039	0004	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UE transmit timing accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094040	0005	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094041	0006	-	Correction CR to 36.521-3: Update of Requirements conditions for E-UTRAN FDD - UE timing advance adjustment accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094042	0007	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094043	0008	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094045	0009	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094047	0010	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Contention Based Random Access test	8.0.1	8.1.0
2009-09	RAN#45	R5-094048	0011	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Non-Contention Based Random Access test	8.0.1	8.1.0

2009-09	RAN#45	R5-094049	0012	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094050	0013	-	Correction CR to 36.521-3: Update of E-UTRAN FDD-FDD Intra-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094051	0014	-	Correction CR to 36.521-3: Update of Annex H Default Message Contents for support of RRM	8.0.1	8.1.0
2009-09	RAN#45	R5-094217	0015	-	Update for E-UTRA FDD - UTRA TDD cell reselection	8.0.1	8.1.0
2009-09	RAN#45	R5-094218	0016	-	Test proposal for E-UTRA FDD - UTRA TDD HO	8.0.1	8.1.0
2009-09	RAN#45	R5-094219	0017	-	Test proposal for E-UTRA TDD random access: contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094220	0018	-	Test proposal for E-UTRA TDD random access: non-contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094221	0019	-	Update for TDD Intra-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094222	0020	-	Update for TDD Inter-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094223	0021	-	Update for E-UTRAN TDD Transmit timing accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094225	0022	-	Update for E-UTRA FDD - UTRA TDD cell search(fading)	8.0.1	8.1.0
2009-09	RAN#45	R5-094253	0023	-	CR to 36.521-3: Addition of E-UTRAN FDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094254	0024	-	CR to 36.521-3: Addition of E-UTRAN FDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094285	0025	-	LTE-RRM: Introduction of Common Exception messages table for E-UTRAN TDD-UTRAN FDD handover and E-UTRAN TDD-UTRAN FDD measurements	8.0.1	8.1.0
2009-09	RAN#45	R5-094358	0026	-	Correction to RSRP measurement accuracy test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094442	0027	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094709	0028	-	LTE RRM: Correction to test cases 4.4.1 and 4.4.2	8.0.1	8.1.0
2009-09	RAN#45	R5-094713	0029	-	Resubmission - Update to E-UTRAN to HRPD Cell Re-Selection (HRPD is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094720	0030	-	Resubmission - Update to E-UTRAN to CDMA2000 1xRTT Cell Re-Selection (CDMA2000 1xRTT is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094743	0031	-	RRM TCs in test mode	8.0.1	8.1.0
2009-09	RAN#45	R5-094927	0032	-	Correction CR to 36.521-3: Update of inter-frequency E-UTRAN TDD-TDD cell re-selection 4.2.6	8.0.1	8.1.0
2009-09	RAN#45	R5-094928	0033	-	Correction CR to 36.521-3: Update of E-UTRAN TDD - UTRAN TDD cell re-selection 4.3.4	8.0.1	8.1.0
2009-09	RAN#45	R5-094929	0034	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094930	0035	-	LTE-RRM: Addition of common messages to Annex H	8.0.1	8.1.0
2009-09	RAN#45	R5-094931	0036	-	Test Proposal for E-UTRAN TDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094932	0037	-	Test Proposal for E-UTRAN TDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094933	0038	-	Update for E-UTRAN TDD Timing advanced adjustment accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094934	0039	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094935	0040	-	E-UTRA TDD - TDD Intra frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094936	0041	-	TDD - TDD RSRP measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094937	0042	-	Update 8.10.1 E-UTRAN TDD-GSM event triggered reporting in AWGN	8.0.1	8.1.0
2009-09	RAN#45	R5-094938	0043	-	Add new tc 8.10.2 EUTRAN TDD-GSM cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094939	0044	-	Add new tc 8.7.2 EUTRAN TDD - UTRAN TDD cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094940	0045	-	E-UTRA TDD - TDD Inter frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094942	0046	-	Update to Annex E Cell Configuration Mapping	8.0.1	8.1.0
2009-09	RAN#45	R5-094967	0047	-	RRM Radio Link Monitoring FDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094968	0048	-	RRM Radio Link Monitoring TDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094969	0050	-	RRM: E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting	8.0.1	8.1.0
2009-09	RAN#45	R5-094970	0051	-	CR to 36.521-3:Message updates for RSRP and RSRQ Accuracy measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094971	0052	-	RRM OCNG and RMC update	8.0.1	8.1.0
2009-09	RAN#45	R5-094972	0053	-	RRM: Update of Annex E for SON	8.0.1	8.1.0
2009-12	RAN#46	R5-095492	0054	-	Removal of test state 4 in RRM test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-095493	0055	-	CR to 36.521-3 Annexes of E-UTRAN cell reselection test cases	8.1.0	8.2.0

2009-12	RAN#46	R5-095499	0056	-	CR for E-UTRAN FDD - UTRAN TDD handover	8.1.0	8.2.0
2009-12	RAN#46	R5-095501	0057	-	CR for E-UTRAN TDD - UE Transmit Timing Accuracy	8.1.0	8.2.0
2009-12	RAN#46	R5-095503	0058	-	CR for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095504	0059	-	Correction to TDD RSRP and RSRQ measurement requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095527	0060	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD cell re-selection intra frequency case and inter frequency case conformance minimum requirements updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095528	0061	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of higher priority and UTRA FDD is of lower priority conformance minimum requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095529	0062	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting under fading propagation conditions in asynchronous cells case	8.1.0	8.2.0
2009-12	RAN#46	R5-095530	0063	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095531	0064	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Intra Frequency event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095537	0065	-	Correction CR to 36.521-3: E-UTRAN FDD - UE Transmit Timing Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-095538	0066	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD inter frequency event triggered reporting when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-095557	0067	-	Correction CR to 36.521-3: General RRM Updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095572	0068	-	Update TC 8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095573	0069	-	Update TC 8.10.2 E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	8.1.0	8.2.0
2009-12	RAN#46	R5-095576	0070	-	Update TC 8.2.1 E-UTRAN TDD - TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.1.0	8.2.0
2009-12	RAN#46	R5-095591	0071	-	update of Annex H.2.3 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-095741	0072	-	CR to the inconsistent expression in UE Measurements Procedures	8.1.0	8.2.0
2009-12	RAN#46	R5-095917	0073	-	Update: Radio Link Monitoring test cases: no DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096145	0074	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency Absolute RSRP Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-096243	0075	-	Update to RRM TC:E-UTRAN FDD - UTRAN TDD cell re-selection	8.1.0	8.2.0
2009-12	RAN#46	R5-096244	0104	1	Addition of new TC to 36.521-3: E-UTRAN TDD - UTRAN FDD cell re-selection test	8.1.0	8.2.0
2009-12	RAN#46	R5-096246	0105	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096247	0106	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096255	0076	-	CR to the RA response window's name in Random Access conformance requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-096257	0077	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	8.1.0	8.2.0
2009-12	RAN#46	R5-096258	0078	1	Addition of new TC to 36.521-3:E-UTRAN TDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096263	0079	1	Add new TC 5.1.6 E-UTRAN TDD - TDD inter frequency handover: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096265	0080	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-096267	0081	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096268	0082	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096269	0083	-	RRM: Update of test case 8.4.1 TDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096271	0084	-	LTE-RF: Update to Annex E Cell Configuration Mapping	8.1.0	8.2.0
2009-12	RAN#46	R5-096272	0085	-	Correction CR to 36.521-3: Addition of message contents exceptions for E-UTRAN inter frequency and inter-RAT Cell Search for when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096273	0086	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRA FDD Handover case	8.1.0	8.2.0
2009-12	RAN#46	R5-096274	0087	-	CR to 36.521-3: Update to FDD Intra-frequency RRC Re-establishment test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096275	0088	-	CR to 36.521-3: Update to FDD Inter-frequency RRC Re-establishment test case	8.1.0	8.2.0

2009-12	RAN#46	R5-096276	0107	-	Test Case of E-UTRAN TDD to GSM Handover	8.1.0	8.2.0
2009-12	RAN#46	R5-096296	0089	-	Update TC 8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-096302	0090	-	Correction CR to 36.521-3: E-UTRAN FDD - GSM event triggered reporting in AWGN case	8.1.0	8.2.0
2009-12	RAN#46	R5-096303	0091	-	Addition of new TC to 36.521-3: E-UTRAN TDD to E-UTRAN TDD and UTRA TDD cell search test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096310	0092	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096324	0093	-	Addition of new TC to 36.521-3 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096325	0094	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - FDD inter frequency Handover test cases: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096326	0095	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096327	0096	-	Addition of new TC to 36.521-3: E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096328	0097	-	E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096329	0098	-	E-UTRAN FDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096330	0099	-	E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096331	0100	-	E-UTRAN TDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096332	0101	-	RRM: Update of test case 8.3.1 FDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096337	0102	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Handover intra frequency and inter frequency case	8.1.0	8.2.0
2009-12	RAN#46	R5-096340	0103	-	Introduction of uncertainties for RRM test cases 4.2.1 and 4.2.2	8.1.0	8.2.0
2010-03	RAN#47	R5-100130	0108	-	Test Tolerances and alignment with 36.133 for cell re-selection intra frequency cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100132	0109	-	Uncertainties and Test Tolerances for inter frequency cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100135	0110	-	Clarification of Extreme conditions for RSRP test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100362	0113	-	CR about the Cell Search Requirements for LTE FDD-FDD/ TDD-TDD Handover to Unknown Target Cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100365	0114	-	CR on updating the handover delay requirements for E-UTRAN TDD - TDD both intra-frequency and inter-frequency handovers	8.2.0	8.3.0
2010-03	RAN#47	R5-100367	0115	-	CR to correct the test requirements of reselection from E-UTRAN FDD/TDD to UTRAN TDD	8.2.0	8.3.0
2010-03	RAN#47	R5-100394	0116	-	Correction of Annex H about measurement performance messages	8.2.0	8.3.0
2010-03	RAN#47	R5-100401	0117	-	RRM Inter frequency cell search updates, TC 8.3.1 and 8.4.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100438	0118	-	Update TC 8.7.1, 8.9.1 and 8.11.4	8.2.0	8.3.0
2010-03	RAN#47	R5-100460	0119	-	Misc update on 521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100486	0120	-	CR to 36.521-3: Addition of E-UTRA FDD to HRPD Handover: Unknown Target Cell and E-UTRA FDD to cdma2000 1xRTT Handover: Unknown Target Cell test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100519	0121	-	Correction to RSRP Accuracy test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100546	0122	-	CR to 36.521-3: Update to E-UTRAN FDD RRC Re-establishment test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100562	0123	-	CR to 36.521-3: Update LTE RRM test cases with test requirements for extended LTE1500	8.2.0	8.3.0
2010-03	RAN#47	R5-100714	0124	-	Addition of missing Es/Noc parameters in RRM test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100715	0125	-	Correction to GSM measurement configuration in Annex H.3.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100716	0126	-	Update on Annex C for 36.521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100849	0127	-	Text on exclusion of extra delay due to RRC retransmission	8.2.0	8.3.0
2010-03	RAN#47	R5-100850	0128	-	Correction to test iteration procedure in cell re-selection TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100852	0129	-	DL Mac Padding for RRM TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100853	0130	-	Update TC 5.1.6 E-UTRAN TDD-TDD inter frequency handover unknown target cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100854	0131	-	New RRM test case, 8.7.3 E-UTRAN TDD SON ANR	8.2.0	8.3.0

2010-03	RAN#47	R5-100859	0132	-	Update TC 8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	8.2.0	8.3.0
2010-03	RAN#47	R5-100860	0133	-	Update TC 8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100861	0134	-	Update TC 8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100862	0135	-	Misc update on test applicability	8.2.0	8.3.0
2010-03	RAN#47	R5-100865	0136	-	CR about corrections of PDSCH Reference Measurement Channels	8.2.0	8.3.0
2010-03	RAN#47	R5-100866	0137	-	CR about OFDMA Channel Noise Generator (OCNG)	8.2.0	8.3.0
2010-03	RAN#47	R5-100873	0138	-	CR to 36.521-3 Rel-8 Introduction of E-UTRAN FDD - FDD Intra Frequency Cell Search with DRX when L3 filtering is used	8.2.0	8.3.0
2010-03	RAN#47	R5-100890	0139	-	Update to RRM TC: TDD Intra frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100896	0140	-	Clarification on Time offset between cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100897	0141	-	Update to RRM TC:E-UTRAN TDD-TDD cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100898	0142	-	Update to RRM TC: TDD Inter frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100900	0143	-	Uncertainties and Test Tolerances for FDD Intra Frequency Absolute RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100901	0144	-	RRM TTIdcch and cell timing change, update of chapter 8	8.2.0	8.3.0
2010-03	RAN#47	-	-	-	Moved to v9.0.0 with no change	8.3.0	9.0.0
2010-06	RAN#48	R5-103105	0145	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0146	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0147	-	Reference to TR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0149	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0150	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0151	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0152	-	Annex E update	9.0.0	9.1.0
2010-06	RAN#48	R5-103496	0153	-	LTE-RRM: Update of test procedure for measurement performance test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103526	0154	-	CR 36.521-3 on corrections to requirements in Idle Mode	9.0.0	9.1.0
2010-06	RAN#48	R5-103528	0155	-	CR 36.521-3 on correction to InterRAT handover minimum requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103531	0156	-	CR 36.521-3 on correction to measurement requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103532	0157	-	CR 36.521-3 on correction to E-UTRA inter frequency cell search requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103534	0158	-	CR 36.521-3 on correction to UE transmit timing minimum and test requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103541	0159	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103546	0160	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in asynchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103547	0161	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in synchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103548	0162	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD-TDD intra frequency cell search under fading in synchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103607	0163	-	Correction to step of physical cell identity change in 4.2.3	9.0.0	9.1.0
2010-06	RAN#48	R5-103608	0164	-	Correction of test mode reference to 36.508	9.0.0	9.1.0
2010-06	RAN#48	R5-103611	0165	-	Correction to the references of exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103612	0166	-	Correction to b2-Threshold1 in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103613	0194	-	Correction to Radio Resource Configuration in UE transmit timing and UE timing advance TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103614	0195	-	Correction to Gap Pattern Id in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103615	0196	-	Correction to Measure object and ID in the exceptional messages	9.0.0	9.1.0
2010-06	RAN#48	R5-103658	0197	-	Iteration in cell reselection tests	9.0.0	9.1.0
2010-06	RAN#48	R5-103709	0167	-	Connection diagram reference for intra-freq measurement TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103724	0168	-	LTE-RRM:CR to E-UTRAN TDD RRC Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103734	0169	-	Test Tolerances and alignment for RLM FDD TC 7.3.1, 7.3.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103736	0170	-	Uncertainties and Test Tolerances for Inter Frequency Absolute RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103737	0171	-	Uncertainties and Test Tolerances for TC 8.1.3 and 8.2.2	9.0.0	9.1.0

2010-06	RAN#48	R5-103738	0172	-	Uncertainties and Test Tolerances for TC 8.4.1 and 8.4.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103739	0173	-	LTE-RRM: CR for Test Tolerances of intra-freq hand over test cases (5.1.1 & 5.1.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103740	0174	-	LTE-RRM:CR for Test Tolerances of inter-freq absolute RSRQ accuracy test cases (9.2.3.1 & 9.2.4.1)	9.0.0	9.1.0
2010-06	RAN#48	R5-103741	0175	-	LTE-RRM:CR for Test Tolerances of inter-freq relative RSRQ accuracy test cases (9.2.3.2 & 9.2.4.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103742	0176	-	Uncertainties and Test Tolerances for Inter Frequency Relative RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103743	0177	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq absolute RSRP accuracy Test	9.0.0	9.1.0
2010-06	RAN#48	R5-103744	0178	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq relative RSRP accuracy Test case	9.0.0	9.1.0
2010-06	RAN#48	R5-103745	0179	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD-TDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103746	0180	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD HO inter-frequency case in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103747	0181	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD intra frequency cell search in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103748	0182	-	Addition of test tolerances and system uncertainties for FDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103749	0183	-	Addition of test tolerances and system uncertainties for TDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103750	0184	-	Additions to measurement uncertainties and Test Tolerances for FDD and TDD intra frequency absolute RSRQ accuracy in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103758	0185	-	CR on 36.521-3 for corrections of missing Es/Noc parameters in RRM test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103759	0186	-	Adding new test case 8.11.5 Combined E-UTRAN - EUTRAN FDD and GSM cell search	9.0.0	9.1.0
2010-06	RAN#48	R5-103760	0187	-	Adding new test case 8.11.6 Combined E-UTRAN - EUTRAN TDD and GSM cell search.	9.0.0	9.1.0
2010-06	RAN#48	R5-103761	0188	-	Adding test case 8.7.3, 8.11.5, 8.11.6 to Annex E Cell configuration mapping.	9.0.0	9.1.0
2010-06	RAN#48	R5-103769	0189	-	Adding band 20, 800MHz in EU to TS36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103773	0190	-	Iteration in Handover and Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103779	0191	-	LTE-RRM: Addition of new TC E-UTRAN FDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103783	0192	-	Correction to q-RxLevMin for E-UTRAN - GSM cell re-selection	9.0.0	9.1.0
2010-06	RAN#48	R5-103784	0145	-	DL Mac Padding for RRM TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103105	0146	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0147	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0201	-	Reference to FTR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0150	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0151	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0152	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0153	-	Annex E update	9.0.0	9.1.0
2010-09	RAN#49	R5-104098	0198	-	PUSCH Scheduling for RRM tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104103	0199	-	Delay exclusion for retransmissions in RRM test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104108	0200	-	Expiry of contention resolution timer in Contention based PRACH test	9.1.0	9.2.0
2010-09	RAN#49	R5-104160	0201	-	Uncertainties and Test Tolerances for FDD Intra Frequency Relative RSRP Accuracy section 9.1.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104230	0202	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection intra frequency case 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104231	0203	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection inter frequency case 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104232	0204	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover intra frequency case 5.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104233	0205	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover inter frequency case 5.1.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104247	0206	-	Addition of Cell Configuration Mapping for Cell Search Test	9.1.0	9.2.0
2010-09	RAN#49	R5-104248	0207	-	CR to 36.521-3 on Correction to cell search	9.1.0	9.2.0
2010-09	RAN#49	R5-104249	0208	-	CR to 36.521-3 on Correction to UE Measurement Procedures	9.1.0	9.2.0
2010-09	RAN#49	R5-104250	0209	-	CR to 36.521-3 on Correction to RRM Cell Search	9.1.0	9.2.0
2010-09	RAN#49	R5-104251	0210	-	CR to 36.521-3 on Correction to RRM General	9.1.0	9.2.0

2010-09	RAN#49	R5-104260	0211	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104261	0212	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104262	0213	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104263	0214	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH RSCP absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104451	0215	-	Test Tolerances and alignment for RLM FDD TC 7.3.3, 7.3.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104452	0216	-	Test Tolerances and alignment for RLM FDD TC 7.3.5, 7.3.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104453	0217	-	Test Tolerances and alignment for RLM TDD TC 7.3.7, 7.3.8	9.1.0	9.2.0
2010-09	RAN#49	R5-104456	0218	-	Uncertainties and Test Tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104460	0219	-	Uncertainties and Test Tolerances for E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	9.1.0	9.2.0
2010-09	RAN#49	R5-104497	0220	-	Clarification on the neighbour cell info	9.1.0	9.2.0
2010-09	RAN#49	R5-104498	0221	-	Addition of the exceptional message to UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104499	0222	-	Maintenance on exceptional messages for annex info	9.1.0	9.2.0
2010-09	RAN#49	R5-104500	0223	-	Correction to 6.1.1 and 6.1.2 of RRC Re-establishment test case	9.1.0	9.2.0
2010-09	RAN#49	R5-104501	0224	-	Maintenance on exceptional messages for Mobility Control Info	9.1.0	9.2.0
2010-09	RAN#49	R5-104521	0225	-	36521-3 General update of sections 00 to 07: missing Introduction references formatting	9.1.0	9.2.0
2010-09	RAN#49	R5-104563	0226	-	Update on exclusion of extra delay due to RRC retransmission	9.1.0	9.2.0
2010-09	RAN#49	R5-104616	0227	-	36.521-3 Correction to test procedure in 8.11.5 and 8.11.6 test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104625	0228	-	E-UTRAN TDD inter-frequency reselection test	9.1.0	9.2.0
2010-09	RAN#49	R5-104650	0229	-	Clarifications of test requirements in measurement accuracy tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104663	0230	-	36.521-3: Annex B and Annex C update	9.1.0	9.2.0
2010-09	RAN#49	R5-104825	0231	-	Missing cell Identity change step for test cases with unknown cell 2 timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104826	0232	-	Addition of test tolerances and system uncertainties for FDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104827	0233	-	Addition of test tolerances and system uncertainties for TDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104828	0234	-	Additions to measurement uncertainties and test tolerances for timing characteristics tests in annex F	9.1.0	9.2.0
2010-09	RAN#49	R5-104829	0235	-	Uncertainties and Test Tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104830	0236	-	Uncertainties and Test Tolerances for E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	9.1.0	9.2.0
2010-09	RAN#49	R5-104839	0237	-	36521-3: Editorial update of sections 08	9.1.0	9.2.0
2010-09	RAN#49	R5-104849	0238	-	Maintenance on the exceptional messages in Ch8 - Annex	9.1.0	9.2.0
2010-09	RAN#49	R5-104855	0239	-	Uncertainties, Test Tolerances and Test Requirements for UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104856	0240	-	GSM carrier RSSI measurement accuracy in E-UTRAN TDD	9.1.0	9.2.0
2010-09	RAN#49	R5-104859	0241	-	E-UTRAN_to_UTRAN_FDD_reselection	9.1.0	9.2.0
2010-09	RAN#49	R5-104864	0242	-	Applicability of RRM inter-frequency test cases to (narrow) frequency bands	9.1.0	9.2.0
2010-09	RAN#49	R5-104865	0243	-	Maintenance on the exceptional messages in Ch5 - Ch6	9.1.0	9.2.0
2010-09	RAN#49	R5-104866	0244	-	36.521-3: Annex E update	9.1.0	9.2.0
2010-09	RAN#49	R5-104880	0245	-	Correction to E-UTRAN to UTRAN Cell Re-Selection test case	9.1.0	9.2.0
2010-09	RAN#49	R5-104881	0246	-	Redundant information in RRM Random Access Test Requirements	9.1.0	9.2.0
2010-09	RAN#49	R5-104883	0247	-	E-UTRAN TDD to UTRAN FDD Handover	9.1.0	9.2.0
2010-09	RAN#49	R5-104885	0248	-	Cell ID change time and iteration procedure for RRM test cases 4.2.1, 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104886	0249	-	Cell ID change time for RRM test cases 4.2.3, 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104887	0250	-	Scrambling code change time for RRM test cases 4.3.1.1, 4.3.4.1, 8.5.2, 8.7.3, 8.11.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104889	0251	-	Iteration procedure for handover and re-establishment test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104890	0252	-	Correction to cell re-selection inter frequency test case	9.1.0	9.2.0

2010-09	RAN#49	R5-105057	0253	-	Clarification of Radio link monitoring test cases	9.1.0	9.2.0
2010-09	RAN#49	RP-100941	0254	-	Correction of status for RRM test cases and missing information in Annex	9.1.0	9.2.0
-	-	-	-	-	Re-insertion of the ambiguous step 11 of cl. 5.2.2.4.2 according to R5-104825 after email discussion	9.2.0	9.2.1
2010-12	RAN#50	R5-106079	0255	-	HARQ delay exclusion for HO test: Clarification for UE-DTX-case	9.2.1	9.3.0
2010-12	RAN#50	R5-106080	0256	-	Iteration procedure for inter RAT handover test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106082	0257	-	Corrections to event triggered measurement tests using DRX (Clause 8)	9.2.1	9.3.0
2010-12	RAN#50	R5-106083	0258	-	Missing titles in the RRM specification	9.2.1	9.3.0
2010-12	RAN#50	R5-106085	0259	-	Scheduling of System information for RRM tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106086	0260	-	Update of PDCCH aggregation level for channel BW 1,4 MHz	9.2.1	9.3.0
2010-12	RAN#50	R5-106119	0261	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41.	9.2.1	9.3.0
2010-12	RAN#50	R5-106313	0262	-	Uncertainties and Test Tolerances for Connected State Mobility test	9.2.1	9.3.0
2010-12	RAN#50	R5-106314	0263	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Test in Annex	9.2.1	9.3.0
2010-12	RAN#50	R5-106318	0264	-	Correction to inter-RAT Connected State Mobility test setup	9.2.1	9.3.0
2010-12	RAN#50	R5-106320	0265	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106321	0266	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.2.1	9.3.0
2010-12	RAN#50	R5-106322	0267	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106448	0268	-	Addition of SIB7 exceptional messages	9.2.1	9.3.0
2010-12	RAN#50	R5-106451	0269	-	Correction to UE transmit timing TC	9.2.1	9.3.0
2010-12	RAN#50	R5-106455	0270	-	Correction to the exceptional messages in RSRQ tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106456	0271	-	Correction to Min Test time for RRM fading tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106483	0272	-	Annex E update	9.2.1	9.3.0
2010-12	RAN#50	R5-106493	0273	-	CR to 36.521-3: Update to G.2.6 Test Conditions for Delay Tests and UE Measurement Performance	9.2.1	9.3.0
2010-12	RAN#50	R5-106805	0274	-	Correction to test case 5.1.2 - Update of E-UTRAN TDD-TDD Handover intra frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106806	0275	-	Correction to test case 5.1.4 - Update of E-UTRAN TDD-TDD Handover inter frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106807	0276	-	Correction to Inter-RAT UE Measurements Procedures	9.2.1	9.3.0
2010-12	RAN#50	R5-106808	0277	-	Correction to Inter-RAT UE Measurements Procedures under fading	9.2.1	9.3.0
2010-12	RAN#50	R5-106810	0278	-	Correction to test case 8.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106811	0279	-	Correction to test case 8.2.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106812	0295	-	Update of RRM OCNG patterns	9.2.1	9.3.0
2010-12	RAN#50	R5-106829	0280	-	General Corrections to RRC_IDLE State Mobility	9.2.1	9.3.0
2010-12	RAN#50	R5-106830	0281	-	Correction to test case 6.2.3	9.2.1	9.3.0
2010-12	RAN#50	R5-106831	0282	-	Correction to test case 6.2.4	9.2.1	9.3.0
2010-12	RAN#50	R5-106832	0283	-	Correction to MeasConfig-DEFAULT in RRM TCs	9.2.1	9.3.0
2010-12	RAN#50	R5-106833	0284	-	Adding support of inter-band test configuration for RRM inter-frequency/inter-RAT test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106834	0285	-	CR on UEs RRM Band applicability	9.2.1	9.3.0
2010-12	RAN#50	R5-106835	0286	-	Correction to test case 7.1.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106836	0287	-	Correction to test case 10.1.2.1, 9.1.2.2 and 9.2.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106840	0288	-	Update to Radio Link Monitoring Test Cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106857	0291	-	Correction to DL configuration on Non-Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106859	0292	-	Corrections to UE transmit timing tests (Subclause 7.3)	9.2.1	9.3.0
2010-12	RAN#50	R5-106862	0293	-	Correction to DL configuration on Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106864	0294	-	Update of Annex G for RLM test in DRX	9.2.1	9.3.0
2010-12	RAN#50	R5-106870	0289	-	Uncertainties and Test Tolerances for UE measurements procedures test	9.2.1	9.3.0
2010-12	RAN#50	R5-106871	0290	-	Addition to Measurement Uncertainties and Test Tolerances for UE Measurement Procedures test in Annex	9.2.1	9.3.0
2011-03	RAN#51	R5-110150	0296	-	RRC Re-establishment tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110151	0297	-	Radio link monitoring tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110155	0298	-	UE Measurements Procedures tests: Test loop	9.3.0	9.4.0
2011-03	RAN#51	R5-110167	0299	-	Removal of [ ] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references	9.3.0	9.4.0
2011-03	RAN#51	R5-110348	0300	-	Revision of 36.521-3 Annex G - Statistical testing	9.3.0	9.4.0

2011-03	RAN#51	R5-110418	0301	-	Correction to TDD cell re-selection	9.3.0	9.4.0
2011-03	RAN#51	R5-110419	0302	-	Correction to exception messages in 4.5.1 HRPD Re selection test	9.3.0	9.4.0
2011-03	RAN#51	R5-110424	0303	-	Alignment of exception messages for TDD event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110435	0304	-	Modification of message content definition for TC 8.4.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110437	0305	-	Update to TC 8.6.1: E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110438	0306	-	Correction to TC 8.7.1: E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110443	0307	-	Update to TC 8.8.1: E-UTRAN FDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110445	0308	-	Corrections to TC 8.9.1: E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110520	0309	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110546	0310	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test	9.3.0	9.4.0
2011-03	RAN#51	R5-110549	0312	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test	9.3.0	9.4.0
2011-03	RAN#51	R5-110584	0314	-	Correction to gap pattern ID in test case 5.1.4	9.3.0	9.4.0
2011-03	RAN#51	R5-110586	0315	-	Clarification to 1.4 MHz testing and applicability in test case 7.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110588	0316	-	Test time limit correction for DRX=40ms in test case 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110863	0330	-	Higher SNR on event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110866	0311	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110868	0313	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110902	0317	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41	9.3.0	9.4.0
2011-03	RAN#51	R5-110903	0318	-	Correction to exception messages in 5.3.1 HRPD HHO test	9.3.0	9.4.0
2011-03	RAN#51	R5-110904	0319	-	MIMO Correlation scenario for RLM test cases	9.3.0	9.4.0
2011-03	RAN#51	R5-110905	0320	-	Enabling HARQ for section 8 and 9 RRM Tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110907	0321	-	Re-ordering of Time periods, definition of uncertainties, and addition of Test Tolerances for RRM test case 4.3.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110910	0322	-	Updated Test Tolerances for RRM Test cases 7.1.1 + 7.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110911	0323	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110912	0324	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110927	0325	-	Corrections to RRM TC 8.1.1, 8.1.2 and 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110928	0326	-	Corrections to test cases about E-UTRAN FDD-FDD Inter-frequency measurement 8.3.1, 8.3.2 and 8.3.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110929	0327	-	Corrections to TCs related to E-UTRAN FDD - UTRAN measurements: 8.5.1, 8.5.2 and 8.5.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110930	0328	-	UE Measurement procedures tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110931	0329	-	DL-RMC-s and OCNG for RRM tests: Updates	9.3.0	9.4.0
2011-03	RAN#51	R5-110946	0331	-	Uncertainties and Test Tolerances for RRM test case 4.3.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110948	0332	-	Uncertainties and Test Tolerances for RRM test cases 4.4.1 and 4.4.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110956	0333	-	Modification of test case 5.1.6 - E-UTRAN TDD-TDD inter frequency handover: unknown target cell	9.3.0	9.4.0
2011-03	RAN#51	R5-110957	0334	-	LTE RRM: reference to state 3A in 36.521-3	9.3.0	9.4.0
2011-03	RAN#51	R5-110958	0335	-	Correction to RRM testes for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110959	0336	-	CR to 36.521-3: E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110960	0337	-	CR to 36.521-3: Addition of Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110961	0338	-	CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110962	0339	-	Correction to exception messages in Radio Link Monitoring Test	9.3.0	9.4.0
2011-03	RAN#51	R5-110963	0340	-	Correction to TC 8.4.2: E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	9.3.0	9.4.0

2011-03	RAN#51	R5-110964	0341	-	Corrections to TC 8.7.3: E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110965	0342	-	Correct the message definitions related to the RSRP and RSRQ performance testing	9.3.0	9.4.0
2011-03	RAN#51	R5-110966	0343	-	Update of RRM test 8.5.2 FDD SON	9.3.0	9.4.0
2011-03	RAN#51	R5-110974	0344	-	PUSCH scheduling: Correction for considering DRX	9.3.0	9.4.0
2011-03	RAN#51	R5-110980	0345	-	Correction to TC 8.8.2: E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110981	0346	-	Update to TC 8.10.1: E-UTRAN TDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110982	0347	-	Corrections to TC 8.10.2: E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110983	0348	-	Modification to TC 8.7.2: E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110995	0352	-	Radio link monitoring test 7.3.4: Minor correction to the test requirement	9.3.0	9.4.0
2011-03	RAN#51	R5-110996	0353	-	Radio link monitoring tests: Corrections to the test procedure	9.3.0	9.4.0
2011-06	RAN#52	R5-112124	0354	-	Uncertainties and Test Tolerances for RRM test case 8.7.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112126	0355	-	Uncertainties and Test Tolerances for RRM test case 8.7.2	9.4.0	9.5.0
2011-06	RAN#52	R5-112128	0356	-	Uncertainties and Test Tolerances for RRM test cases 8.8.1+8.10.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112152	0357	-	RRM TC-s 4.2: Transition between time intervals	9.4.0	9.5.0
2011-06	RAN#52	R5-112153	0358	-	RRM TC 4.2.6: Introduction of time duration T0	9.4.0	9.5.0
2011-06	RAN#52	R5-112155	0359	-	RRM TC-s clause 8: Reference to the state 3A / 3A-RF in the test loop	9.4.0	9.5.0
2011-06	RAN#52	R5-112185	0360	-	Addition of new RRM TC 4.3.4.3: EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	9.4.0	9.5.0
2011-06	RAN#52	R5-112314	0365	-	Correction to E-UTRAN FDD - UTRAN FDD cell re-selection when UTRA FDD is under lower priority	9.4.0	9.5.0
2011-06	RAN#52	R5-112315	0366	-	Correction to E-UTRA FDD-high UTRA FDD inter RAT cell re-selection test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112316	0367	-	Correction to E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions	9.4.0	9.5.0
2011-06	RAN#52	R5-112317	0368	-	Correction on test cases of E-UTRA to UTRA cell reselection in idle state	9.4.0	9.5.0
2011-06	RAN#52	R5-112318	0369	-	Correction to E-UTRAN TDD - UTRAN TDD test case in 36.521-3	9.4.0	9.5.0
2011-06	RAN#52	R5-112418	0370	-	Update of 4.3.1.3 E-UTRA-UTRA reselection test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112421	0371	-	Correction to 6.1 RRC Re-establishment test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112423	0372	-	Maintenance on Message contents in 8.5.3	9.4.0	9.5.0
2011-06	RAN#52	R5-112424	0373	-	Correction to Annex H.3.3 for Inter-RAT E-UTRAN - HRPD handover	9.4.0	9.5.0
2011-06	RAN#52	R5-112454	0374	-	Wrong references into statistical annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112457	0375	-	References into connection diagrams in 36.508,Annex A	9.4.0	9.5.0
2011-06	RAN#52	R5-112470	0376	-	Misalignment in Meas Gap configuration	9.4.0	9.5.0
2011-06	RAN#52	R5-112475	0377	-	Band 20 missing in section 9 test cases	9.4.0	9.5.0
2011-06	RAN#52	R5-112533	0378	-	Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM test	9.4.0	9.5.0
2011-06	RAN#52	R5-112536	0379	-	Addition to Measurement Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112543	0380	-	Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM unknown test	9.4.0	9.5.0
2011-06	RAN#52	R5-112544	0381	-	Addition to Measurement Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM unknown test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112546	0382	-	Uncertainties and Test Tolerances for Inter-RAT to UTRAN event triggered reporting under fading test	9.4.0	9.5.0
2011-06	RAN#52	R5-112554	0383	-	Uncertainties and Test Tolerances for Inter-RAT to GSM event triggered when DRX is used in AWGN tests	9.4.0	9.5.0
2011-06	RAN#52	R5-112555	0384	-	Addition to Measurement Uncertainties and Test Tolerances for Inter-RAT to GSM event triggered when DRX is used in AWGN tests in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112734	0385	-	Addition of Band 24 to section 9.1 and 9.2 , RSRP and RSRQ measurement performance requirements	9.4.0	9.5.0
2011-06	RAN#52	R5-112741	0363	-	Uncertainties and Test Tolerances for RRM test case 10.3.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112742	0364	-	Uncertainties and Test Tolerances for RRM test case 9.3.2	9.4.0	9.5.0
2011-06	RAN#52	R5-112745	0394	-	Completing for E-UTRAN TDD-UTRAN TDD cell reselection_UTRA is of lower priority	9.4.0	9.5.0

2011-06	RAN#52	R5-112746	0395	-	Completing for E-UTRAN FDD-UTRAN FDD-UTRAN TDD cell reselection	9.4.0	9.5.0
2011-06	RAN#52	R5-112803	0386	-	Addition to Measurement Uncertainties and Test Tolerances for Inter-RAT to UTRAN event triggered reporting under fading test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112815	0387	-	Correction to test frequency references in RRM initial condition	9.4.0	9.5.0
2011-06	RAN#52	R5-112817	0388	-	RRM TC-s 8.1.1, 8.1.2, 8.1.3, 8.2.1, 8.2.2: Changing SNR for serving cell	9.4.0	9.5.0
2011-06	RAN#52	R5-112818	0389	-	RRM TC 9.6.2: Overall corrections	9.4.0	9.5.0
2011-06	RAN#52	R5-112819	0390	-	CR for 9.4 UTRA FDD measurement accuracy	9.4.0	9.5.0
2011-06	RAN#52	R5-112820	0391	-	Add test frequencies for bands 42, 43 (3500MHz)	9.4.0	9.5.0
2011-06	RAN#52	R5-112849	0398	-	Update of clause 3A.3 RRM test configuration	9.4.0	9.5.0
2011-06	RAN#52	R5-112853	0399	-	Correction to inconsistent test procedures in RRM	9.4.0	9.5.0
2011-06	RAN#52	R5-112855	0400	-	Uncertainties and Test Tolerances for RRM test case 5.2.10	9.4.0	9.5.0
2011-06	RAN#52	R5-112858	0401	-	Addition of new RRM TC 8.4.3: E-UTRAN TDD-TDD inter-freq event triggered reporting under AWGN in synchronous cells with DRX when L3 filtering is used	9.4.0	9.5.0
2011-09	RAN#53	R5-113183	0402	-	RRM TC 8: Adding missing PRACH Configuration for some tests	9.5.0	9.6.0
2011-09	RAN#53	R5-113226	0403	-	Uncertainties and Test Tolerances for RRM test case 4.3.1.3	9.5.0	9.6.0
2011-09	RAN#53	R5-113249	0404	-	Uncertainties and Test Tolerances for TC 5.2.1	9.5.0	9.6.0
2011-09	RAN#53	R5-113250	0405	-	Uncertainties and Test Tolerances for TC 5.2.2	9.5.0	9.6.0
2011-09	RAN#53	R5-113395	0406	-	Not tested minimum requirement in Clause 8	9.5.0	9.6.0
2011-09	RAN#53	R5-113460	0407	-	Correction to 4.2.3	9.5.0	9.6.0
2011-09	RAN#53	R5-113461	0408	-	Correction to the exceptional messages in HO TCs with unknown target cell	9.5.0	9.6.0
2011-09	RAN#53	R5-113462	0409	-	Maintenance on the exceptional messages for Mobility Control Info	9.5.0	9.6.0
2011-09	RAN#53	R5-113463	0410	-	Correction to 6.2.3 and 6.2.4	9.5.0	9.6.0
2011-09	RAN#53	R5-113466	0411	-	Correction to FDD RSRP and RSRQ test	9.5.0	9.6.0
2011-09	RAN#53	R5-113467	0412	-	Correction to TDD RSRP and RSRQ test for band 41	9.5.0	9.6.0
2011-09	RAN#53	R5-113468	0413	-	Correction to the exceptional messages in Annex H	9.5.0	9.6.0
2011-09	RAN#53	R5-113597	0414	-	Abbreviation update and Editorial corrections in TS36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-113843	0443	-	Adding FGI Applicabilities into Chapters 4 - 7 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-113844	0440	-	RRM TCs 5.1: PRACH power configuration	9.5.0	9.6.0
2011-09	RAN#53	R5-113845	0444	-	RRM TCs 7.3: Update of the test procedure and requirements	9.5.0	9.6.0
2011-09	RAN#53	R5-113846	0425	-	Statistical clarification for TC 8.3.3 and 8.3.4	9.5.0	9.6.0
2011-09	RAN#53	R5-114005	0415	-	LTE-RRM: Corrections to test iteration for test case 4.3.4.1	9.5.0	9.6.0
2011-09	RAN#53	R5-114007	0416	-	Correction on the inter-RAT cell identification time in DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114009	0417	-	Completing for E-UTRAN TDD - UTRAN TDD handover test case	9.5.0	9.6.0
2011-09	RAN#53	R5-114013	0418	-	Uncertainties and Test Tolerance for FDD SON ANR test case 8.5.2	9.5.0	9.6.0
2011-09	RAN#53	R5-114016	0419	-	Uncertainties and Test Tolerances for TC 9.4.1 and 9.4.2	9.5.0	9.6.0
2011-09	RAN#53	R5-114019	0420	-	CR Uncertainties and TT for 8.4.3 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114021	0421	-	CR Uncertainties and TT for 4.3.4.3 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114026	0422	-	Deletion of editor note for discrepancy between TT and 36.903	9.5.0	9.6.0
2011-09	RAN#53	R5-114050	0423	-	RRM: Use of State 3A-RF	9.5.0	9.6.0
2011-09	RAN#53	R5-114055	0424	-	RRM TCs 7.2: Transition between iteration loops	9.5.0	9.6.0
2011-09	RAN#53	R5-114057	0426	-	Statistical clarification in 6 Test cases in clause 8.11.	9.5.0	9.6.0
2011-09	RAN#53	R5-114059	0427	-	Completing for E-UTRAN TDD-UTRAN TDD cell re-selection_UTRA is of higher priority	9.5.0	9.6.0
2011-09	RAN#53	R5-114060	0428	-	Uncertainties and Test Tolerances for TC 8.9.1	9.5.0	9.6.0
2011-09	RAN#53	R5-114072	0429	-	Update LTE RRM test requirements for FDD LTE Band 23 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114084	0430	-	Simplification of frequency dependent minimum requirements in TS36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114097	0431	-	Adding FGI Applicabilities into Chapters 8 - 9 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114099	0432	-	Addition of new RRM TC 8.1.5 ÜE-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114100	0433	-	Addition of new RRM TC 8.1.6: E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114101	0434	-	Addition of new RRM TC 8.2.3: E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0

2011-09	RAN#53	R5-114102	0435	-	Addition of new RRM TC 8.2.4: E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114103	0436	-	Addition of new RRM TC 8.3.4 UE-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114104	0437	-	Addition of new RRM TC 8.3.5:E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114105	0438	-	Addition of new RRM TC 8.4.4:E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114106	0439	-	Addition of new RRM TC 8.4.5:E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114111	0441	-	Correction to RLM	9.5.0	9.6.0
2011-09	RAN#53	R5-114115	0442	-	LTE-RRM: Correction to test procedure for inter-RAT cell reselection test cases	9.5.0	9.6.0
2011-09	RAN#53	R5-114119	0445	-	Introduction of Expanded 1900MHz Band (Band 25) into section 9 of 36.521-3	9.5.0	9.6.0
2011-12	RAN#54	R5-115121	0446	-	RRM TC-s 7, 8: Iteration loop and usage of the UE states 3A / 3A-RF	9.6.0	9.7.0
2011-12	RAN#54	R5-115140	0447	-	Modify the test requirement table in the TC 5.2.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115142	0449	-	LTE-RRM :Update to Annex E	9.6.0	9.7.0
2011-12	RAN#54	R5-115189	0452	-	Uncertainties and Test Tolerances for RRM test case 8.11.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115199	0453	-	Correction of references to Annex I in TS36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115200	0454	-	Test System uncertainties for frequencies between 3000MHz to 4200MHz in 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115202	0456	-	Uncertainties and Test Tolerance for TDD SON ANR test case 8.7.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115327	0457	-	Correction to RRM tests 7.1.2 and 7.2.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115379	0458	-	Update of operating band configuration	9.6.0	9.7.0
2011-12	RAN#54	R5-115381	0459	-	Correction to FGI in test applicability for Cell reselection test case	9.6.0	9.7.0
2011-12	RAN#54	R5-115385	0460	-	Correction to 5.2.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115386	0461	-	Alignment of the exceptional messages in 7.3.x RLM	9.6.0	9.7.0
2011-12	RAN#54	R5-115387	0462	-	Correction to 8.10.1 and 8.10.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115388	0463	-	Correction to the exceptional message in 8.6.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115403	0465	-	Uncertainties and Test Tolerances for RRM test case 4.3.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115433	0466	-	Corrections to TC 5.1.5 and TC 5.1.6 inter-f HO: unknown target cell	9.6.0	9.7.0
2011-12	RAN#54	R5-115435	0467	-	Updates of TC 5.2.3: E-UTRAN FDD - GSM handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115479	0468	-	Corrections to RSRQ in Intra-Frequency Measurement Minimum Requirements	9.6.0	9.7.0
2011-12	RAN#54	R5-115482	0469	-	Addition to measurement uncertainties and test tolerances E-UTRAN FDD - UTRAN FDD event triggered reporting w/DRX under fading test in Annex	9.6.0	9.7.0
2011-12	RAN#54	R5-115787	0471	-	Uncertainties and Test Tolerances for RRM test case 8.11.1 and 8.11.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115582	0472	-	RRM TC 6.2: Corrections to power settings	9.6.0	9.7.0
2011-12	RAN#54	R5-115814	0473	-	Incomplete test case for 7.1.1 and 7.1.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115823	0474	-	Uncertainties and TT for TC 6.1.3 and 6.1.4 in 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115827	0477	-	Correction to Test Tolerances for RRM ch.9 test cases	9.6.0	9.7.0
2011-12	RAN#54	R5-115833	0478	-	Adding band 22 (3500MHz FDD) to 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115834	0479	-	RRM: Phase rotation for intra frequency tests in static conditions	9.6.0	9.7.0
2011-12	RAN#54	R5-115835	0480	-	Addition of the exceptional message in 4.6.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115836	0481	-	Addition of undefined UTRA system information for TC 4.3.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115838	0482	-	Corrections to TC 5.2.1 and TC 5.2.2: E-UTRAN FDD/TDD - UTRAN FDD handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115839	0483	-	Corrections to message content definition for TC 5.1.1 and TC 5.1.2: intra-f HO	9.6.0	9.7.0
2011-12	RAN#54	R5-115840	0484	-	Updates to TC 5.1.3 and TC 5.1.4: inter-f HO	9.6.0	9.7.0
2011-12	RAN#54	R5-115841	0485	-	Updates of TC 5.2.4 and TC 5.2.5: E-UTRAN FDD/TDD - UTRAN TDD handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115842	0486	-	Removal of measurement related message definitions in TC 5.2.7, TC 5.2.9 and TC 5.2.10	9.6.0	9.7.0
2011-12	RAN#54	R5-115843	0487	-	Modification of message definitions in the Annex H	9.6.0	9.7.0
2011-12	RAN#54	R5-115844	0488	-	Modification of the test cases of Random Access	9.6.0	9.7.0
2011-12	RAN#54	R5-115845	0489	-	RRM TC-s 9: Missing bands in specification	9.6.0	9.7.0

2011-12	RAN#54	R5-115846	0490	-	RRM TC-s 7.3: SRS configuration in radio link monitoring tests	9.6.0	9.7.0
2011-12	RAN#54	R5-115847	0491	-	Correction to test frequency in MeasConfig-DEFAULT	9.6.0	9.7.0
2011-12	RAN#54	R5-115848	0492	-	Corrections to TC 7.1.1 and TC 7.1.2: UE Transmit Timing Accuracy	9.6.0	9.7.0
2011-12	RAN#54	R5-115850	0493	-	Correction to 5.2.6	9.6.0	9.7.0
2011-12	RAN#54	R5-115878	0494	-	Correction to cell reselection delay in test procedure	9.6.0	9.7.0
2011-12	RAN#54	R5-115882	0495	-	Addition of undefined UTRA system information for TC 4.3.1.2 and TC 4.3.1.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115883	0496	-	Addition of undefined UTRA system information for TC 4.3.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115884	0497	-	Addition of undefined UTRA system information for TC 4.3.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115885	0498	-	Addition of undefined UTRA system information for TC 4.3.4.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115886	0499	-	Addition of UTRA system information definitions for TC 4.3.4.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115887	0500	-	Updates of the message content definitions for TC 4.3.4.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115888	0501	-	Updates of TC 4.4.1 and TC 4.4.2: E-UTRAN FDD/TDD - GSM cell re-selection	9.6.0	9.7.0
2011-12	RAN#54	R5-115786	0502	-	Corrections to test cases for E-UTRAN RRC Re-establishment	9.6.0	9.7.0
2011-12	RAN#54	R5-115893	0503	-	RRM TC-s 4: General review of the test procedures of cell re-selection test cases	9.6.0	9.7.0
2011-12	RAN#54	R5-115481	0504	-	Uncertainties and test tolerances E-UTRAN FDD - UTRAN FDD event triggered reporting w/DRX under fading test	9.6.0	9.7.0
2012-03	RAN#55	R5-120107	0505	-	Uncertainties and Test Tolerance for E-UTRAN TDD Intra-frequency new CGI test cases 8.2.3 and 8.2.4	9.7.0	9.8.0
2012-03	RAN#55	R5-120124	0506	-	Uncertainties and Test Tolerance for E-UTRAN TDD Inter-frequency new CGI test cases 8.4.4 and 8.4.5.	9.7.0	9.8.0
2012-03	RAN#55	R5-120141	0507	-	RRM: Iteration loop in cdma2000 reselection tests	9.7.0	9.8.0
2012-03	RAN#55	R5-120178	0508	-	RF/RRM: Correction on TC 8.4.1 message content definition	9.7.0	9.8.0
2012-03	RAN#55	R5-120183	0509	-	RF/RRM: Addition of new TC 4.2.4 E-UTRAN FDD - TDD cell re-selection inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120184	0510	-	RF/RRM: Addition of new TC 4.2.5 E-UTRAN TDD - FDD cell re-selection inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120185	0511	-	RF/RRM: Addition of new TC 5.1.7 E-UTRAN FDD - TDD handover inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120186	0512	-	RF/RRM: Addition of new TC 5.1.8 E-UTRAN TDD - FDD handover Inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120187	0513	-	RF/RRM: Addition of new TC 8.12.1 E-UTRAN TDD - FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	9.7.0	9.8.0
2012-03	RAN#55	R5-120189	0514	-	RF/RRM: Addition of new TC 9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy	9.7.0	9.8.0
2012-03	RAN#55	R5-120190	0515	-	RF/RRM: Addition of new TC 9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP	9.7.0	9.8.0
2012-03	RAN#55	R5-120191	0516	-	RF/RRM: Addition of Cell configuration mapping for those new RRM test cases	9.7.0	9.8.0
2012-03	RAN#55	R5-120245	0517	-	Update of 36.521-3 Test Cases 9.1.4.1 and 9.1.4.2, Io difference band-independent	9.7.0	9.8.0
2012-03	RAN#55	R5-120249	0518	-	Uncertainties and Test Tolerances for RRM test case 8.11.4	9.7.0	9.8.0
2012-03	RAN#55	R5-120321	0519	-	Update of 4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120322	0520	-	Update of 4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120323	0521	-	Adding E-UTRAN test parameter reference to messages exception	9.7.0	9.8.0
2012-03	RAN#55	R5-120324	0522	-	Correction to 4.6.1.1 E-UTRAN FDD c2k cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120325	0523	-	Correction to 5.2.4 E-UTRAN TDD - UTRAN TDD handover	9.7.0	9.8.0
2012-03	RAN#55	R5-120339	0524	-	Addition of FGI bit 16 into test cases 9.1.x.x and 9.2.x.x	9.7.0	9.8.0
2012-03	RAN#55	R5-120341	0525	-	Correction to FGI bits in test case 8.5.2	9.7.0	9.8.0
2012-03	RAN#55	R5-120424	0526	-	Correction to TIntra in Minimum Conformance Requirements	9.7.0	9.8.0
2012-03	RAN#55	R5-120425	0527	-	Correction to the identification time in DRX for UTRA TDD	9.7.0	9.8.0
2012-03	RAN#55	R5-120515	0528	-	Addition of FGI bit 15 into test cases configuring event 1B	9.7.0	9.8.0
2012-03	RAN#55	R5-120808	0535	-	RF/RRM: Corrections on RSRP and RSRQ accuracy related test cases	9.7.0	9.8.0
2012-03	RAN#55	R5-120809	0536	-	TS 36.521-3: 8.3.3 and 8.4.3 T2 value correction	9.7.0	9.8.0
2012-03	RAN#55	R5-120810	0537	-	TS 36.521-3: 6.2.3 Extreme conditions test tolerance correction	9.7.0	9.8.0

2012-03	RAN#55	R5-120827	0538	-	Correction to CQI report configuration of 7.1.1 in TS36.521-3	9.7.0	9.8.0
2012-03	RAN#55	R5-120846	0539	-	Test configuration for Inter RAT testcases, delete note	9.7.0	9.8.0
2012-03	RAN#55	R5-120847	0540	-	RF/RRM: Addition of new TC 8.13.1 E-UTRAN FDD - TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	9.7.0	9.8.0
2012-03	RAN#55	R5-120848	0541	-	Correction to 8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR	9.7.0	9.8.0
2012-03	RAN#55	R5-120892	0542	-	Update of PRACH test case	9.7.0	9.8.0
2012-03	RAN#55	R5-120894	0543	-	Correction to 5.2.10 E-UTRAN TDD - UTRAN TDD handover	9.7.0	9.8.0
2012-03	RAN#55	R5-120895	0544	-	Correction to test frequency in MeasConfig-DEFAULT for E-UTRAN to GSM cell search test case	9.7.0	9.8.0
2012-03	RAN#55	R5-120907	0547	-	Uncertainties and Test Tolerances for E-UTRAN to HRPD Cell reselection TC 4.5.1.1	9.7.0	9.8.0
2012-03	RAN#55	R5-120917	0546	-	Uncertainties and Test Tolerances for E-UTRAN to HRPD HO TC 5.3.1	9.7.0	9.8.0
2012-03	RAN#55	R5-120530	0529	-	Introduction to FDD RSRQ for E-UTRA Carrier Aggregation	9.8.0	10.0.0
2012-03	RAN#55	R5-120531	0530	-	Introduction to TDD RSRQ for E-UTRA Carrier Aggregation	9.8.0	10.0.0
2012-03	RAN#55	R5-120532	0531	-	Introduction to FDD RSRQ for E-UTRA Carrier Aggregation in Annex	9.8.0	10.0.0
2012-03	RAN#55	R5-120533	0532	-	Introduction to TDD RSRQ for E-UTRA Carrier Aggregation in Annex	9.8.0	10.0.0
2012-03	RAN#55	R5-120535	0533	-	Introduction to Carrier Aggregation in Radio Resource Management	9.8.0	10.0.0
2012-03	RAN#55	R5-120536	0534	-	Introduction to Carrier Aggregation in Default Message Contents	9.8.0	10.0.0
2012-06	RAN#56	R5-121229	0549	-	Correction of test procedures for Autonomous gap test cases, section 8	10.0.0	10.1.0
2012-06	RAN#56	R5-121240	0550	-	Revise test frequencies for FDD-TDD interworking Test cases	10.0.0	10.1.0
2012-06	RAN#56	R5-121247	0551	-	RRM: Removal of Editors note on connection diagram used in intra frequency tests in static conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-121527	0552	-	Addition of Handover to UTRAN commands in 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121528	0553	-	Correction of drx-RetransmissionTimer parameters	10.0.0	10.1.0
2012-06	RAN#56	R5-121529	0554	-	Correction to Test2 in 7.1.1 and 7.1.2 of 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121530	0555	-	Correction to DRX offset in 7.1.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121532	0557	-	Correction to 8.11.1 and 8.11.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121547	0558	-	Addition of new TCs for UTRAN TDD P-CCPCH RSCP measurement	10.0.0	10.1.0
2012-06	RAN#56	R5-121691	0559	-	TS 36.521-3: 8.3.3 and 8.4.3 update	10.0.0	10.1.0
2012-06	RAN#56	R5-121901	0560	-	Introduction of E-UTRAN Inter Introduction of E-UTRAN Inter frequency case reselection in the existence of non-allowed CSG cell	10.0.0	10.1.0
2012-06	RAN#56	R5-121902	0561	-	Addition of new RRM TC 6.3.1: Redirection from E-UTRAN FDD to UTRAN FDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121922	0562	-	Addition of new RRM TC 6.3.2: Redirection from E-UTRAN TDD to UTRAN FDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121923	0563	-	Addition of new RRM TC 6.3.3: Redirection from E-UTRAN FDD to GERAN when System Information is provided	10.0.0	10.1.0
2012-06	RAN#56	R5-121924	0564	-	Addition of new RRM TC 6.3.4: Redirection from E-UTRAN TDD to GERAN when System Information is provided	10.0.0	10.1.0
2012-06	RAN#56	R5-121927	0565	-	Uncertainties and Test Tolerances for TC 9.6.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121929	0566	-	Uncertainties and Test Tolerances for RRM test cases 4.2.4 and 4.2.5	10.0.0	10.1.0
2012-06	RAN#56	R5-121930	0567	-	Uncertainties and Test Tolerances for RRM test cases 5.1.7 and 5.1.8	10.0.0	10.1.0
2012-06	RAN#56	R5-121931	0568	-	Uncertainties and Test Tolerances for RRM test cases 8.14.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121932	0569	-	Uncertainties and Test Tolerances for RRM test case 8.15.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121933	0570	-	Uncertainties and Test Tolerances for RRM test case 9.1.5.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121934	0571	-	Uncertainties and Test Tolerances for FDD - TDD Inter Frequency Relative Accuracy of RSRP test case 9.1.5.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121940	0572	-	Correction to the test mode references for RRM tests	10.0.0	10.1.0
2012-06	RAN#56	R5-121941	0573	-	Addition of new RRM TC 6.3.5: E-UTRA TDD RRC connection release redirection to UTRA TDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121942	0574	-	RRM: Introduction of Annex for handling of different releases and UE capabilities	10.0.0	10.1.0
2012-06	RAN#56	R5-121969	0575	-	Adding operating band 26 to TS 36.521-3	10.0.0	10.1.0

2012-06	RAN#56	R5-121977	0576	-	Change in transmit timing tests based on DRX feature group indicator	10.0.0	10.1.0
2012-06	RAN#56	R5-121980	0577	-	Clarifications to FDD RSRQ for E-UTRA Carrier Aggregation	10.0.0	10.1.0
2012-06	RAN#56	R5-121981	0578	-	Clarifications to TDD RSRQ for E-UTRA Carrier Aggregation	10.0.0	10.1.0
2012-06	RAN#56	R5-121991	0579	-	Further Test Tolerance analysis for operating band 25 and 41 in 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121998	0580	-	Addition of new RRM TC 6.3.6: E-UTRA FDD RRC connection release redirection to UTRA TDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121999	0581	-	Addition of new RRM TC 8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122000	0582	-	Addition of new RRM TC 8.7.4 E-UTRA TDD-UTRA TDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122001	0583	-	Addition of new RRM TC 8.9.2 E-UTRA FDD-UTRA TDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122002	0584	-	RRM: Clarifications to the OCNG patterns	10.0.0	10.1.0
2012-06	RAN#56	R5-122007	0556	-	Correction to SR Config Index for TDD DRX test cases	10.0.0	10.1.0
2012-09	RAN#57	R5-123065	0585	-	Correction to References in Annex I	10.1.0	10.2.0
2012-09	RAN#57	R5-123149	0587	-	Corrections to E-UTRAN FDD intra frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123151	0588	-	Corrections to E-UTRAN FDD inter frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123152	0589	-	Corrections to E-UTRAN TDD intra frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123153	0590	-	Corrections to E-UTRAN TDD inter frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123163	0591	-	Introduction of E-UTRAN TDD-TDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.1.0	10.2.0
2012-09	RAN#57	R5-123166	0592	-	Correction to FDD RSRQ for E-UTRA Carrier Aggregation tests	10.1.0	10.2.0
2012-09	RAN#57	R5-123167	0593	-	Correction to TDD RSRQ for E-UTRA Carrier Aggregation tests	10.1.0	10.2.0
2012-09	RAN#57	R5-123168	0594	-	Introduction of default RRC messages exceptions for Carrier Aggregation	10.1.0	10.2.0
2012-09	RAN#57	R5-123281	0596	-	Addition of new TC 4.6.2.1 E-UTRAN TDD-cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	10.1.0	10.2.0
2012-09	RAN#57	R5-123290	0597	-	Addition of new TC 8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions	10.1.0	10.2.0
2012-09	RAN#57	R5-123291	0598	-	Addition of new TC 8.19.1 E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions	10.1.0	10.2.0
2012-09	RAN#57	R5-123292	0599	-	Annex H message content updates	10.1.0	10.2.0
2012-09	RAN#57	R5-123301	0600	-	Addition of Cell configuration mapping for new RRM test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123335	0601	-	Correction to transmit timing test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123336	0602	-	Addition of band indicator for GERAN	10.1.0	10.2.0
2012-09	RAN#57	R5-123426	0603	-	RRM: Update of Annex J	10.1.0	10.2.0
2012-09	RAN#57	R5-123903	0606	-	Addition of new RRM TC 4.5.2.1 E-UTRAN TDD-HRPD Cell Reselection: HRPD is of Lower Priority	10.1.0	10.2.0
2012-09	RAN#57	R5-123904	0607	-	Addition of new TC 5.3.5 E-UTRAN TDD-HRPD Handover	10.1.0	10.2.0
2012-09	RAN#57	R5-123905	0608	-	Addition of new TC 6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123906	0609	-	Addition of new TC 6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	10.1.0	10.2.0
2012-09	RAN#57	R5-123907	0610	-	Addition of new TC 6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123908	0611	-	Addition of new TC 6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123916	0612	-	Introduction of Chapter9 absolute and relative RSRP measurement test cases for carrier aggregation (TC 9.1.6.1 and 9.1.6.2)	10.1.0	10.2.0
2012-09	RAN#57	R5-123920	0613	-	Uncertainties and Test Tolerances for E-UTRAN FDD, TDD Inter frequency reselection in the existence of non-allowed CSG cell Test cases 4.2.7 and 4.2.8	10.1.0	10.2.0
2012-09	RAN#57	R5-123935	0614	-	Addition of new TC 5.3.6 E-UTRAN TDD-cdma2000 1X Handover	10.1.0	10.2.0
2012-09	RAN#57	R5-123936	0615	-	Addition of new TC 6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	10.1.0	10.2.0

2012-09	RAN#57	R5-123937	0616	-	Addition of new TC 6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123938	0617	-	Addition of new TC 9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	10.1.0	10.2.0
2012-09	RAN#57	R5-123939	0618	-	Addition of new TC 9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	10.1.0	10.2.0
2012-09	RAN#57	R5-123940	0619	-	Addition of new TC 8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	10.1.0	10.2.0
2012-09	RAN#57	R5-123941	0620	-	Addition of new TC 8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	10.1.0	10.2.0
2012-09	RAN#57	R5-123959	0621	-	Introduction of E-UTRAN FDD-FDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.1.0	10.2.0
2012-09	RAN#57	R5-123960	0622	-	Introduction of E-UTRAN Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA in Annex	10.1.0	10.2.0
2012-09	RAN#57	R5-123995	0623	-	Addition of new TC 8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	10.1.0	10.2.0
2012-09	RAN#57	R5-123996	0624	-	Addition of new TC 8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	10.1.0	10.2.0
2012-09	RAN#57	R5-123998	0625	-	RRM: Further avoidance of frequency overlapping for inter-frequency and inter-RAT	10.1.0	10.2.0
2012-09	RAN#57	R5-123999	0626	-	Adding clauses in TS36.521-3 with references for positioning test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123789	0605	-	Implementation of only partly implemented CR: Clarification of the release of UTRAN-EUTRAN Inter-RAT RRM test cases in 36.521-3	10.2.0	10.2.1
2012-12	RAN#58	R5-124155	0667	-	New TC(8.20) introduction of inter-frequency/RAT measurements in CA mode	10.3.0	10.4.0
2012-12	RAN#58	R5-124172	0668	-	Correction to TC 8.16.3 E-UTRAN FDD-FDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.3.0	10.4.0
2012-12	RAN#58	R5-124173	0669	-	Corrections to TC 8.16.4 E-UTRAN TDD-TDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.3.0	10.4.0
2012-12	RAN#58	R5-124174	0670	-	Introduction of default RRC messages exceptions for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-124180	0671	-	Addition of new cell configuration mapping for CA related test cases	10.3.0	10.4.0
2012-12	RAN#58	R5-125209	0627	-	RRM TC 9.1.6.1: General updates and corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125210	0628	-	RRM TC 9.1.6.2: General updates and corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125328	0629	-	RRM Annex C: Addition of physical channel settings for eICIC tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125335	0630	-	RRM Annex A: Addition of measurement channels for eICIC tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125337	0631	-	RRM New TC 7.3.9: Test skeleton for E-UTRAN FDD Radio Link Monitoring Out-of-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125338	0632	-	RRM New TC 7.3.10: Test skeleton for E-UTRAN TDD Radio Link Monitoring Out-of-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125339	0633	-	RRM New TC 7.3.11: Test skeleton for E-UTRAN FDD Radio Link Monitoring In-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125340	0634	-	RRM New TC 7.3.12: Test skeleton for E-UTRAN TDD Radio Link Monitoring In-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125341	0635	-	RRM New TC 8.1.7: Test skeleton for E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125342	0636	-	RRM New TC 8.2.5: Test skeleton for E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125344	0637	-	RRM TC 9.6.2: General corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125363	0638	-	Update Test cases 5.2.3+5.2.6 uncertainties for >3GHz	10.3.0	10.4.0
2012-12	RAN#58	R5-125364	0639	-	Fading margin for RRM Test cases 8.3.1, 8.3.2, 8.4.1, 8.4.2, 8.14.1 and 8.15.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125366	0640	-	Procedure and requirements for Test cases 4.2.7 and 4.2.8	10.3.0	10.4.0
2012-12	RAN#58	R5-125368	0641	-	Correction of RSRP values in the Test Requirement for RRM Test case 5.3.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125382	0642	-	Clean up of TDD related RRM tests in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125427	0643	-	Correction to TC 9.2.5.1 FDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0

2012-12	RAN#58	R5-125430	0644	-	Correction to TC 9.2.6.1 TDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125538	0645	-	RRM TC 9.6.1: Introduction of GSM RSSI accuracy for E-UTRAN FDD	10.3.0	10.4.0
2012-12	RAN#58	R5-125549	0646	-	Uncertainties and Test Tolerances for TC 4.5.2.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125551	0647	-	Uncertainties and Test Tolerances for TC 5.3.5	10.3.0	10.4.0
2012-12	RAN#58	R5-125553	0648	-	Uncertainties and Test Tolerances for TC 8.14.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125555	0649	-	Uncertainties and Test Tolerances for TC 8.15.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125557	0650	-	Uncertainties and Test Tolerances for TC 8.14.3 and 8.15.3	10.3.0	10.4.0
2012-12	RAN#58	R5-125559	0651	-	Uncertainties and Test Tolerances for TC 9.2.4A.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125561	0652	-	Uncertainties and Test Tolerances for TC 9.2.4A.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125576	0665	-	Correction to Table 9.2.1.1.5-2 in subclause 9.2.1.1.5	10.3.0	10.4.0
2012-12	RAN#58	R5-125812	0653	-	Correction to RRM 9.3.1 in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125813	0654	-	Addition of new TC 8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX including uncertainties and Test Tolerances	10.3.0	10.4.0
2012-12	RAN#58	R5-125814	0655	-	Addition of new TC 8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX including uncertainties and Test Tolerances	10.3.0	10.4.0
2012-12	RAN#58	R5-125865	0656	-	Introduction of Band 27 to TS 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125878	0657	-	Correction to TC 9.2.5.2 FDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125879	0658	-	Correction to TC 9.2.6.2 TDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125888	0659	-	Correction to accuracy requirements in RSRP/RSRQ test for Band 26in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125889	0660	-	Correction to RRM 9.4.1 in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125922	0661	-	Update Test Procedure and Test Tolerances for UE Transmit Timing Accuracy	10.3.0	10.4.0
2012-12	RAN#58	R5-126045	0663	-	Addition of a new TC 9.1.7.1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-126046	0664	-	Addition of a new TC 9.1.7.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-126064	0662	-	Correction to RRM 4.2.7 in 36.521-3	10.3.0	10.4.0
2013-03	RAN#59	R5-130058	0666	-	Uncertainties and Test Tolerances for RRM test cases 9.1.6.1 and 9.1.7.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130060	0667	-	Uncertainties and Test Tolerances for RRM test cases 9.1.6.2 and 9.1.7.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130062	0668	-	Uncertainties and Test Tolerances for RRM test cases 9.2.5.1 and 9.2.6.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130162	0705	-	Modifying test requirements for handover test from E-UTRAN to UTRAN TDD	10.4.0	10.5.0
2013-03	RAN#59	R5-130290	0669	-	RRM:Corrections to TC 9.3.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130300	0670	-	RRM: Corrections to TC 9.6.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130301	0671	-	RRM: Corrections to TC 9.6.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130302	0672	-	Editors note for test cases where Test Requirement not valid above 3GHz	10.4.0	10.5.0
2013-03	RAN#59	R5-130395	0673	-	Uncertainties and Test Tolerances for TC 6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	10.4.0	10.5.0
2013-03	RAN#59	R5-130396	0674	-	Uncertainties and Test Tolerances for TC 6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	10.4.0	10.5.0
2013-03	RAN#59	R5-130397	0675	-	Uncertainties and Test Tolerances for TC 6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	10.4.0	10.5.0
2013-03	RAN#59	R5-130398	0676	-	Uncertainties and Test Tolerances for TC 6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	10.4.0	10.5.0
2013-03	RAN#59	R5-130430	0677	-	Correction to RRM 4.2.7 and 4.2.8	10.4.0	10.5.0
2013-03	RAN#59	R5-130436	0678	-	Update of cell configuration mapping in Annex E	10.4.0	10.5.0
2013-03	RAN#59	R5-130468	0706	-	Correction to RRM measurement accuracy tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130803	0680	-	Updates to TC 8.16.3 and 8.16.4	10.4.0	10.5.0
2013-03	RAN#59	R5-130931	0683	-	Update Test Procedure and Test Tolerances for UE Transmit Timing Accuracy	10.4.0	10.5.0
2013-03	RAN#59	R5-130932	0684	-	Uncertainties and Test Tolerances for RRM test cases 9.2.5.2 and 9.2.6.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130934	0685	-	Test Tolerances to TCs 8.16.3 and 8.16.4 Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130781	0686	-	RRM: Updates and corrections to TC 8.1.5	10.4.0	10.5.0
2013-03	RAN#59	R5-130943	0687	-	Correction to sr-ConfigIndex in RRM FDD-TDD dual mode tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130953	0688	-	CA RRM: Corrections to tests with independent events	10.4.0	10.5.0

2013-03	RAN#59	R5-130962	0689	-	Add structure for new eICIC test cases 9.2.7.1 and 9.2.8.1, FDD and TDD RSRQ	10.4.0	10.5.0
2013-03	RAN#59	R5-130981	0690	-	Introduction of Chapter 9 RRM test cases for RSRP accuracy for FDD EUTRA -eICIC	10.4.0	10.5.0
2013-03	RAN#59	R5-130982	0691	-	Introduction of Chapter 9 RRM test cases for RSRP accuracy for TDD EUTRA -eICIC	10.4.0	10.5.0
2013-03	RAN#59	R5-130983	0692	-	Additions to TC 8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130984	0693	-	Additions to TC 8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130985	0694	-	Additions to TC 9.2.5.1 FDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130986	0695	-	Additions to TC 9.2.5.2 FDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130987	0696	-	Additions to TC 9.2.6.1 TDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130988	0697	-	Additions to TC 9.2.6.2 TDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130989	0698	-	Updates to TC 8.16.1 and 8.16.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130990	0699	-	Updates to TCs in section 8.20	10.4.0	10.5.0
2013-03	RAN#59	R5-130991	0700	-	Updates to TCs about FDD and TDD RSRP accuracy for E-UTRA CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130992	0701	-	Updates to TCs about FDD and TDD RSRQ accuracy for E-UTRA CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130993	0702	-	Updates to H.4 default RRC message content for CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130995	0703	-	Correction to RRC Connection Release with Redirection tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130782	0704	-	Correction to new CGI E-UTRA cell with autonomous gaps tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130452	0679	-	Adding operating bands 28 and 44 to Annex I in TS36.521-3	10.5.0	11.0.0
2013-03	RAN#59	R5-130906	0681	-	Introduction of Band 44 for APAC 700 MHz	10.5.0	11.0.0
2013-03	RAN#59	R5-130907	0682	-	Introduction of Band 28 for APAC 700 MHz	10.5.0	11.0.0
2013-06	RAN#60	R5-131105	0707	-	Correction to Test requirement for tests 7.1.X	11.0.0	11.1.0
2013-06	RAN#60	R5-131109	0708	-	eICIC RRM: Addition of MBSFN ABS configuration in annex	11.0.0	11.1.0
2013-06	RAN#60	R5-131110	0709	-	eICIC RRM: Further specification of TC 7.3.9	11.0.0	11.1.0
2013-06	RAN#60	R5-131111	0710	-	eICIC RRM: Further specification of TC 7.3.10	11.0.0	11.1.0
2013-06	RAN#60	R5-131112	0711	-	eICIC RRM: Further specification of TC 7.3.11	11.0.0	11.1.0
2013-06	RAN#60	R5-131113	0712	-	eICIC RRM: Further specification of TC 7.3.12	11.0.0	11.1.0
2013-06	RAN#60	R5-131118	0713	-	CA RRM: References to connection diagrams	11.0.0	11.1.0
2013-06	RAN#60	R5-131148	0714	-	Updates to RRM test case for CA band combo CA_2A-29A	11.0.0	11.1.0
2013-06	RAN#60	R5-131177	0715	-	RRM: FGI bit support in test applicability statement	11.0.0	11.1.0
2013-06	RAN#60	R5-131178	0716	-	RRM TC 9.6: Clarification on testing requirement when no BCCH1 report available	11.0.0	11.1.0
2013-06	RAN#60	R5-131180	0718	-	RRM: Uncertainties and test tolerances for TCs 8.1.5 and 8.1.6	11.0.0	11.1.0
2013-06	RAN#60	R5-131182	0719	-	RRM: Uncertainties and test tolerances for TCs 8.3.4 and 8.3.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131185	0720	-	RRM TC 8.14.2: Minor correction to cross references	11.0.0	11.1.0
2013-06	RAN#60	R5-131186	0721	-	RRM: Several corrections to CGI related test cases	11.0.0	11.1.0
2013-06	RAN#60	R5-131282	0722	-	Uncertainties and Test Tools for eICIC RRM test cases 9.2.7.1, 9.2.8.1	11.0.0	11.1.0
2013-06	RAN#60	R5-131286	0723	-	Uncertainties and Test Tools for RRM test cases 8.11.5, 8.11.6	11.0.0	11.1.0
2013-06	RAN#60	R5-131288	0724	-	Uncertainties and Test Tools for RRM test cases 9.5.1, 9.5.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131291	0725	-	Cleanup of Annex F Introductory Text	11.0.0	11.1.0
2013-06	RAN#60	R5-131403	0726	-	Uncertainties and Test Tolerances for TS 36.521-3 test cases 5.2.4 and 5.2.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131404	0727	-	Uncertainties and Test Tolerances for TS 36.521-3 test case 8.5.4	11.0.0	11.1.0
2013-06	RAN#60	R5-131405	0728	-	Uncertainties and Test Tolerances for TS 36.521-3 test cases 8.7.4 and 8.9.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131445	0729	-	Addition of inter-freq/RAT without measurement gaps TCs	11.0.0	11.1.0
2013-06	RAN#60	R5-131463	0730	-	Uncertainties and Test Tolerances for RRM test cases 6.3.2 and 6.3.12	11.0.0	11.1.0
2013-06	RAN#60	R5-131468	0731	-	Uncertainties and Test Tolerances for RRM test cases 6.3.5+6.3.6+6.3.7+6.3.8	11.0.0	11.1.0
2013-06	RAN#60	R5-131469	0732	-	Modification to test cases 8.7.1 and 8.7.2	11.0.0	11.1.0

2013-06	RAN#60	R5-131517	0733	-	Corrections to RRM requirements for interruption in single CA	11.0.0	11.1.0
2013-06	RAN#60	R5-131529	0734	-	Corrections for RSRQ E-UTRA CA	11.0.0	11.1.0
2013-06	RAN#60	R5-131586	0735	-	Correction to the test cases with the existence of non-allowed CSG cell	11.0.0	11.1.0
2013-06	RAN#60	R5-131590	0736	-	Correction to PRACH configuration	11.0.0	11.1.0
2013-06	RAN#60	R5-131591	0737	-	Correction to Time Alignment Timer	11.0.0	11.1.0
2013-06	RAN#60	R5-131613	0738	-	Editors note for test cases where Test Requirement not valid above 3GHz, clause 8	11.0.0	11.1.0
2013-06	RAN#60	R5-131615	0739	-	Editors note for test cases where Test Requirement not valid above 3GHz, clause 8 - 9	11.0.0	11.1.0
2013-06	RAN#60	R5-131740	0740	-	Corrections of band 26 notes in TS36.521-3	11.0.0	11.1.0
2013-06	RAN#60	R5-131913	0741	-	Change the IE value of System Information Block type 19 for TS36.521-3 TDD test case 4.3.4.1.	11.0.0	11.1.0
2013-06	RAN#60	R5-131922	0742	-	eICIC RRM: Further specification of TC 8.1.7	11.0.0	11.1.0
2013-06	RAN#60	R5-131923	0743	-	eICIC RRM: Further specification of TC 8.2.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131924	0744	-	Structure for new TCs 9.1.8.1, 9.1.8.2, FDD Absolute and Relative eICIC RSRP, Non-MBSFN	11.0.0	11.1.0
2013-06	RAN#60	R5-131925	0745	-	Structure for new TCs 9.1.9.1, 9.1.9.2, TDD Absolute and Relative eICIC RSRP, Non-MBSFN	11.0.0	11.1.0
2013-06	RAN#60	R5-131926	0746	-	Procedure and messages for eICIC RRM test cases 9.2.7.1, 9.2.8.1	11.0.0	11.1.0
2013-06	RAN#60	R5-131938	0747	-	Uncertainties and Test Tolerances for RRM test cases 6.3.4 and 6.3.11	11.0.0	11.1.0
2013-06	RAN#60	R5-131940	0748	-	RRM: Uncertainties and test tolerances for TCs 9.6.1 and 9.6.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131965	0749	-	Correction to RRC Connection Release with Redirection tests	11.0.0	11.1.0
2013-06	RAN#60	R5-131966	0750	-	Correction to Monitored UTRA cell list size	11.0.0	11.1.0
2013-06	RAN#60	R5-131967	0751	-	Correction to UE Transmit Timing Accuracy	11.0.0	11.1.0
2013-06	RAN#60	R5-131986	0752	-	Editors note for test cases where Test Requirement not valid above 3GHz, clauses 4 to 7	11.0.0	11.1.0
2013-06	RAN#60	R5-131992	0753	-	Addition of Chapter 9 RRM test cases for absolute RSRQ accuracy under Time-Domain Measurement Resource Restriction with MBSFN ABS	11.0.0	11.1.0
2013-06	RAN#60	R5-132075	0754	-	Correction to new CGI E-UTRA cell with autonomous gaps tests	11.0.0	11.1.0
2013-06	RAN#60	R5-132107	0755	-	Update of Annex E	11.0.0	11.1.0
2013-06	RAN#60	R5-132112	0756	-	Correction to Combined E-UTRAN - E-UTRA and GSM cell search	11.0.0	11.1.0
2013-06	RAN#60	R5-132114	0757	-	Addition of Band 27 to overlooked sections of TS 36.521-3	11.0.0	11.1.0
2013-09	RAN#61	R5-133101	0758	-	Uncertainties and Test Tolerances for eICIC Absolute RSRP test cases 9.1.8.1+9.1.9.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133103	0759	-	Uncertainties and Test Tolerances for eICIC Relative RSRP test cases 9.1.8.2+9.1.9.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133105	0760	-	Uncertainties and Test Tolerances update for Inter-freq RSRP Test cases 9.1.3.x and 9.1.4.x	11.1.0	11.2.0
2013-09	RAN#61	R5-133142	0761	-	Addition of test cases 7.3.13 and 7.3.15	11.1.0	11.2.0
2013-09	RAN#61	R5-133220	0762	-	RRM: Uncertainties and test tolerances for TCs 9.6.1 and 9.6.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133351	0764	-	Uncertainties and Test Tolerances update for Intra-freq RSRP Test cases 9.1.1.1 and 9.1.2.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133354	0765	-	Band 28 update for Intra-freq relative RSRP Test case 9.1.1.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133421	0766	-	Correction to Common Exception messages for ReportConfig-A6	11.1.0	11.2.0
2013-09	RAN#61	R5-133430	0767	-	Correction to 8.7.3 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133432	0768	-	Correction to 8.11.5 and 8.11.6 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133433	0769	-	Correction to 9.5.1 and 9.5.2 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133435	0770	-	Correction to Common Exception messages in RLM tests	11.1.0	11.2.0
2013-09	RAN#61	R5-133440	0771	-	Addition of TC 7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.1.0	11.2.0
2013-09	RAN#61	R5-133441	0772	-	Addition of TC 7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.1.0	11.2.0
2013-09	RAN#61	R5-133447	0793	-	Correction of configurations in RSRP TDD absolute and relative accuracy for CA test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133528	0773	-	Corrections to Conditions for UE Measurements Procedures in RRC_CONNECTED State	11.1.0	11.2.0
2013-09	RAN#61	R5-133722	0763	-	eICIC RRM: Message contents for TC-s 7.3.9-12, 8.1.7 and 8.2.5	11.1.0	11.2.0

2013-09	RAN#61	R5-133727	0788	-	Corrections to RRM CA measurement accuracy CA test cases with PCell and SCell switching	11.1.0	11.2.0
2013-09	RAN#61	R5-133728	0789	-	Correction to E-UTRAN RSRP and RSRQ accuracy for CA test cases of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133729	0791	-	Correction to CGI test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133809	0774	-	Correction to RRM CA test case 8.16.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133810	0775	-	Correction to RRM CA test case 8.16.3	11.1.0	11.2.0
2013-09	RAN#61	R5-133813	0776	-	Correction to 8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	11.1.0	11.2.0
2013-09	RAN#61	R5-133814	0777	-	Addition of Uplink-downlink configuration in 6.3.5 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133836	0778	-	Cell Timing offsets and Cell Timing uncertainties for CA 8.x and 9.x test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133842	0779	-	Correction to 9.6.1 and 9.6.2 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133855	0780	-	Addition of new CA TC 8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	11.1.0	11.2.0
2013-09	RAN#61	R5-133856	0781	-	Addition of new CA TC 8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	11.1.0	11.2.0
2013-09	RAN#61	R5-133857	0782	-	Addition of new CA TC 9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133858	0783	-	Addition of new CA TC 9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133859	0784	-	Correction to RRM CA test case 8.20.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133860	0785	-	New RRM TC 9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133861	0786	-	New RRM TC 9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133862	0787	-	Cell configuration mapping for new CA TCs for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133896	0790	-	Addition of RMC and OCNG pattern for CA 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133901	0792	-	CA RRM: Clarification of applicability and completeness status of CA RRM TC-s	11.1.0	11.2.0
2013-12	RAN#62	R5-134145	0794	-	CA RRM: Uncertainties and test tolerances for TC 9.1.13.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134147	0795	-	CA RRM: Uncertainties and test tolerances for TC 9.1.13.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134149	0796	-	CA RRM: Uncertainties and test tolerances for TC 9.2.12.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134151	0797	-	CA RRM: Uncertainties and test tolerances for TC 9.2.12.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134168	0798	-	Clarification of CGI minimum conformance requirements	11.2.0	11.3.0
2013-12	RAN#62	R5-134186	0799	-	Introduction of TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134187	0800	-	Introduction of TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134188	0801	-	Introduction 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134189	0802	-	Introduction 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134197	0803	-	Receiver sensitivity relaxation of UE for High and Low operating band	11.2.0	11.3.0
2013-12	RAN#62	R5-134221	0808	-	Uncertainties and Test Tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions test case 8.20.3	11.2.0	11.3.0
2013-12	RAN#62	R5-134223	0809	-	Uncertainties and Test Tolerances for eICIC RSRQ test cases 9.2.9.1 and 9.2.10.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134246	0810	-	Reported value correction for RRM test case 9.1.7.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134319	0811	-	RRM: Correction to FGI bit support for TCs 9.1.5.1 and 9.1.5.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134483	0813	-	Update of cell configuration mapping for eICIC RRM in Annex E	11.2.0	11.3.0
2013-12	RAN#62	R5-134491	0814	-	Correction to InterRat HO test case with UTRAN TDD	11.2.0	11.3.0
2013-12	RAN#62	R5-134492	0815	-	Correction to Cell time offset in TDD Inter-RAT test cases	11.2.0	11.3.0
2013-12	RAN#62	R5-134813	0820	-	eICIC RRM: Editorial corrections to section 7 tests	11.2.0	11.3.0
2013-12	RAN#62	R5-134814	0821	-	Updates to Chapter 9 RSRP and RSRQ accuracy test cases under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134815	0822	-	Updates to Chapter 7 FDD RLM test cases under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134852	0829	-	Uncertainties and Test Tolerances update for Intra-freq RSRQ Test cases 9.2.1.1 and 9.2.2.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134862	0830	-	RRM: Updates to the reference measurement channels and OCNG patterns	11.2.0	11.3.0
2013-12	RAN#62	R5-134863	0831	-	Introduction of TDD configuration definitions	11.2.0	11.3.0
2013-12	RAN#62	R5-134864	0832	-	Update of RRM Requirements Exceptions	11.2.0	11.3.0
2013-12	RAN#62	R5-134872	0833	-	Clarification of RRM tests for multiple bandwidths	11.2.0	11.3.0

2013-12	RAN#62	R5-134873	0834	-	Addition of new TC E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	11.2.0	11.3.0
2013-12	RAN#62	R5-134874	0835	-	Update of cell configuration mapping for CA in Annex E	11.2.0	11.3.0
2013-12	RAN#62	R5-134990	0837	-	CA RRM: Corrections to CA event triggered tests on deactivated SCell with PCell interruption in non-DRX	11.2.0	11.3.0
2013-12	RAN#62	R5-135066	0853	-	CA RRM: Corrections to the message contents exceptions for some CA 20 MHz test cases	11.2.0	11.3.0
2013-12	RAN#62	R5-134216	0805	-	Introduction of FDD Inter frequency absolute RSRP for 5MHz Bandwidth Test case 9.1.17.1	11.3.0	12.0.0
2013-12	RAN#62	R5-134218	0807	-	Introduction of FDD Intra frequency absolute RSRQ for 5MHz Bandwidth Test case 9.2.17.1	11.3.0	12.0.0
2013-12	RAN#62	R5-134579	0816	-	Introduction of Band 31 to Annex I conditions for RRM measurements	11.3.0	12.0.0
2013-12	RAN#62	R5-134583	0817	-	Addition of new TC 5.2.11 E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134585	0818	-	Addition of new TC 6.2.5 E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134586	0819	-	Addition of new TC 6.2.6 E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134819	0823	-	Addition of new TC 9.1.16 FDD Intra frequency RSRP Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134820	0824	-	Addition of new TC 9.1.17.2 FDD Inter frequency RSRP Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134822	0826	-	Addition of new TC 9.2.18 FDD Inter frequency RSRQ Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134823	0827	-	Addition of new TC 9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134824	0828	-	Addition of new TC 9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134898	0836	-	Update of band configuration table for Inter Band	11.3.0	12.0.0
2013-12	RAN#62	R5-135033	0838	-	Addition of new TC 4.2.9 E-UTRAN FDD-FDD intra-frequency Cell Re-selection case for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135034	0839	-	Addition of new TC 4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135035	0840	-	Addition of new TC 5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135036	0841	-	Addition of new TC 6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135037	0842	-	Addition of new TC 7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135038	0843	-	Addition of new TC 7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135039	0844	-	Addition of new TC 7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135040	0845	-	Addition of new TC 7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135041	0846	-	Addition of new TC 7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135042	0847	-	Addition of new TC 8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135043	0848	-	Addition of new TC 8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135044	0849	-	Addition of new TC 8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135047	0850	-	Updates to TCs 4.3.1.2 and 4.3.3	11.3.0	12.0.0
2013-12	RAN#62	R5-135048	0851	-	Updates to TCs 5.2.1 and 5.2.2	11.3.0	12.0.0
2013-12	RAN#62	R5-135049	0852	-	Updates the test system uncertainties and test tolerance for TC 6.2.1, 6.2.2, 6.2.3 and 6.2.4	11.3.0	12.0.0
2014-03	RAN#63	R5-140085	0854	-	CA RRM: Uncertainties and test tolerances for TC 8.20.1 and 8.20.2	12.0.0	12.1.0
2014-03	RAN#63	R5-140088	0855	-	Corrections to UE Transmit Timing minimum requirements	12.0.0	12.1.0
2014-03	RAN#63	R5-140089	0856	-	Corrections to measurements of the SCC with deactivated SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-140090	0857	-	Corrections to TC 8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell	12.0.0	12.1.0
2014-03	RAN#63	R5-140234	0859	-	Uncertainties and Test Tolerances for FDD Intra frequency relative RSRP for 5MHz Bandwidth Test case 9.1.16.2 and update 9.1.1.2, 9.1.2.2.	12.0.0	12.1.0

2014-03	RAN#63	R5-140236	0860	-	Uncertainties and Test Tolerances for FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth 9.2.18.1, and update Test cases 9.2.3.1, 9.2.4.1.	12.0.0	12.1.0
2014-03	RAN#63	R5-140238	0861	-	Uncertainties and Test Tolerances for FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth 9.2.18.2, and update Test cases 9.2.3.2, 9.2.4.2.	12.0.0	12.1.0
2014-03	RAN#63	R5-140240	0862	-	Uncertainties and Test Tolerances for E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions test case 8.20.4	12.0.0	12.1.0
2014-03	RAN#63	R5-140241	0863	-	Noc uncertainty for Test Cases 8.5.1, 8.5.3, 8.5.7 and 8.6.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140255	0864	-	CA RRM: Corrections to event triggered reporting under deactivated SCell in non-DRX tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140259	0865	-	CA RRM: Correction and clarification of messages exception on the maximum number of cells to be measured	12.0.0	12.1.0
2014-03	RAN#63	R5-140289	0867	-	Uncertainties and Test Tolerances for RRM test case 7.3.24	12.0.0	12.1.0
2014-03	RAN#63	R5-140295	0868	-	Uncertainties and Test Tolerances for RRM test case 9.3.3	12.0.0	12.1.0
2014-03	RAN#63	R5-140297	0869	-	Uncertainties and Test Tolerances for RRM test case 9.4.3	12.0.0	12.1.0
2014-03	RAN#63	R5-140301	0870	-	Addition of cell configuration mapping for LTE 450 related test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-140401	0871	-	Introduction of operating band groups to TS36.521-3, clause 3	12.0.0	12.1.0
2014-03	RAN#63	R5-140404	0872	-	Introduction of operating band groups to TS36.521-3, Annex I	12.0.0	12.1.0
2014-03	RAN#63	R5-140423	0873	-	Correction to test applicability of measurement without gaps	12.0.0	12.1.0
2014-03	RAN#63	R5-140483	0874	-	Completion and alignment of 5MHz Bandwidth Test cases 9.1.17.1, 9.2.17.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140501	0875	-	Update of exceptions in eICIC RRM with Non-MBSFN	12.0.0	12.1.0
2014-03	RAN#63	R5-140502	0876	-	Update of eICIC RLM test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-140512	0877	-	Correction of UTRA TDD Redirection tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140513	0878	-	Correction to CA RRM Inter frequency tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140562	0879	-	Correction to GSM RSSI absolute accuracy tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140597	0880	-	TC 9.3.1, 9.4.1 Corrections to test procedures in TS36.521-3	12.0.0	12.1.0
2014-03	RAN#63	R5-140810	0881	-	Correction of b2-threshold for EUTRA and GERAN cell	12.0.0	12.1.0
2014-03	RAN#63	R5-140849	0883	-	Additions to TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140850	0884	-	Additions to TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140851	0885	-	Additions to TC 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140852	0886	-	Additions to TC 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140853	0887	-	Addition to TC 7.3.21 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140854	0888	-	Addition to TC 7.3.22 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140855	0889	-	Addition to TC 9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140863	0890	-	Corrections to minimum requirements for time domain measurement	12.0.0	12.1.0
2014-03	RAN#63	R5-140865	0891	-	Uncertainties and Test Tolerances for RRM test case 9.1.16.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140866	0892	-	Uncertainties and Test Tolerances for RRM test case 9.1.17.2	12.0.0	12.1.0
2014-03	RAN#63	R5-140869	0893	-	Corrections to test cases 8.16.3 and 8.16.4	12.0.0	12.1.0
2014-03	RAN#63	R5-140876	0895	-	Introduction of feICIC to Annex H	12.0.0	12.1.0
2014-03	RAN#63	R5-140882	0896	-	Addition to TC 7.3.19 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140883	0897	-	Addition to TC 7.3.20 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0

2014-03	RAN#63	R5-140884	0898	-	Addition to TC 9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140885	0899	-	Addition to TC 9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140886	0900	-	Addition to TC 9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-141021	0901	-	Introduction of operating band groups to TS36.521-3, test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141022	0902	-	Addition of WB-RSRQ measurement test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141023	0903	-	Update of intra-band CA cell mapping in Annex E	12.0.0	12.1.0
2014-03	RAN#63	R5-141024	0904	-	Clarification on operating band configuration for inter-RAT RRM test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141031	0905	-	update to TC 9.4.1 L2W CPICH Ec/No Absolute accuracy	12.0.0	12.1.0
2014-03	RAN#63	R5-141036	0906	-	Addition of new CA RRM TC 7.1.3 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-141037	0907	-	Addition of new CA RRM TC 7.1.4 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-141049	0908	-	Correction to Test2 of UE Transmit Timing Accuracy test cases 7.1.1 and 7.1.2	12.0.0	12.1.0
2014-03	RAN#63	R5-141050	0866	-	Updates Test cases about UE Transmit Timing Accuracy Tests	12.0.0	12.1.0
2014-06	RAN#64	R5-142167	0909	-	Correction of clause 9.2.7.1 in 36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-142180	0910	-	Correction on PDSCH allocation in PRS subframe	12.1.0	12.2.0
2014-06	RAN#64	R5-142212	0911	-	Additions to feICIC RRM test cases in Annex F	12.1.0	12.2.0
2014-06	RAN#64	R5-142222	0912	-	Cleanup of operating band groups in TS36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-142547	0913	-	Uncertainties and Test Tolerances for eICIC Intra-Frequency Event-Triggered Reporting test cases 8.1.7 and 8.2.5	12.1.0	12.2.0
2014-06	RAN#64	R5-142550	0914	-	Uncertainties and Test Tolerances for eICIC RLM out-of-sync Test cases 7.3.9,7.3.10,7.3.13 and 7.3.14	12.1.0	12.2.0
2014-06	RAN#64	R5-142553	0915	-	Uncertainties and Test Tolerances for eICIC RLM In-sync Test cases 7.3.11,7.3.12,7.3.15 and 7.3.16	12.1.0	12.2.0
2014-06	RAN#64	R5-142600	0916	-	Clean-up of eICIC RRM tests	12.1.0	12.2.0
2014-06	RAN#64	R5-142621	0918	-	Clean-up for E-UTRAN RRM test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-142623	0919	-	Update of Annex E for CA RRM Inter frequency tests for Intra-band	12.1.0	12.2.0
2014-06	RAN#64	R5-143018	0920	-	Correction of clause 9.2.8.1 in 36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-143019	0921	-	Update eICIC Absolute RSRP Test cases 9.1.8.1+9.1.9.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143020	0922	-	Update eICIC Absolute RSRQ Test cases 9.2.7.1+9.2.8.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143022	0923	-	Uncertainties and test tolerance for RRM Test case 9.1.10.1, 9.1.11.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143023	0924	-	Uncertainties and test tolerance for RRM Test case 9.1.10.2, 9.1.11.2	12.1.0	12.2.0
2014-06	RAN#64	R5-143024	0925	-	Update to eICIC Absolute RSRQ with MBSFN ABS for chapter 9 RRM test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143057	0926	-	Updates to CA RRM 8.16.x test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143058	0927	-	Correction to UL timing accuracy Tx test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143059	0928	-	Update of Annex E for InterRAT with TDD-TD-SCDMA	12.1.0	12.2.0
2014-06	RAN#64	R5-143062	0929	-	Additions to TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143063	0930	-	Update eICIC Relative RSRP Test cases 9.1.8.2+9.1.9.2	12.1.0	12.2.0
2014-06	RAN#64	R5-143064	0931	-	Additions to TC 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143065	0932	-	Additions to TC 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143066	0933	-	Addition of RLM test cases with non-MBSFN for fEICIC	12.1.0	12.2.0
2014-06	RAN#64	R5-143067	0934	-	Test Cases 9.1.14.1, 9.1.14.2, 9.1.15.1, 9.1.15.2 for feICIC	12.1.0	12.2.0
2014-06	RAN#64	R5-143085	0935	-	Addition of new TC 8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143086	0936	-	Addition of new TC 9.1.18 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143087	0937	-	Addition of new TC 9.1.19 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143088	0938	-	Addition of new TC 9.2.21 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143089	0939	-	Addition of new TC 9.2.22 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.1.0	12.2.0

2014-06	RAN#64	R5-143090	0940	-	Addition of new TC 8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143091	0941	-	Addition of new TC 9.1.20 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143092	0942	-	Addition of new TC 9.1.21 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143093	0943	-	Addition of new TC 9.2.23 FDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143094	0944	-	Addition of new TC 9.2.24 TDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143102	0945	-	Additions to TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143103	0946	-	Additions to feICIC to Annex H	12.1.0	12.2.0
2014-06	RAN#64	R5-143108	0947	-	Correction to periodicity of ABS pattern in eICIC RRM	12.1.0	12.2.0
2014-06	RAN#64	R5-143112	0948	-	Additions to TDD interruption requirements for SCell	12.1.0	12.2.0
2014-06	RAN#64	R5-143152	0949	-	Correction to event triggered reporting tests for CA	12.1.0	12.2.0
2014-06	RAN#64	R5-143153	0950	-	Correction to Intra CA test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143157	0951	-	TC 7.3.19 FDD Radio Link Monitoring for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143158	0952	-	TC 7.3.20 TDD Radio Link Monitoring for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143159	0953	-	TC 7.3.21 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143160	0954	-	TC 7.3.22 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143172	0955	-	Addition of new TC 8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143173	0956	-	Addition of new TC 8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143176	0957	-	Addition of new TC 8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	12.1.0	12.2.0
2014-06	RAN#64	R5-143191	0958	-	Clarification of tracking area updating procedure	12.1.0	12.2.0
2014-06	RAN#64	R5-143209	0917	1	Correction to 9.6.2 GSM RSSI accuracy for E-UTRAN TDD	12.1.0	12.2.0
2014-06	RAN#64	-	-	-	Correction of misplaced Table F.3.2-1 entry of R5-142547	12.2.0	12.2.1
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	-	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0

2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144912	0996	-	Removable of editor's notes for maxReportCells	12.2.1	12.3.0
2014-09	RAN#65	R5-144913	0997	-	Correction to neighCellConfig of MeasObjectEUTRA in CGI tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144927	0998	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	1	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0
2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0

2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144912	0996	-	Removable of editor's notes for maxReportCells	12.2.1	12.3.0
2014-09	RAN#65	R5-144913	0997	-	Correction to neighCellConfig of MeasObjectEUTRA in CGI tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144927	0998	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	1	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0
2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-12	RAN#66	R5-145129	1000	-	CA-RRM: Corrections to TC 8.16.5 and 8.16.6	12.3.0	12.4.0
2014-12	RAN#66	R5-145130	1001	-	RRM: Correction to MBSFN subframes configuration	12.3.0	12.4.0
2014-12	RAN#66	R5-145245	1002	-	eICIC-RRM: Missing uncertainties for TC 8.1.7 and 8.2.5	12.3.0	12.4.0
2014-12	RAN#66	R5-145299	1003	-	Update Uncertainties for Test case 8.5.3	12.3.0	12.4.0
2014-12	RAN#66	R5-145301	1004	-	Uncertainties and Test Tolerances for feICIC RSRQ accuracy Test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145303	1005	-	Uncertainties and Test Tolerances for Test cases 9.2.21.1 and 9.2.22.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145305	1006	-	Uncertainties and Test Tolerances for Test cases 9.2.21.2 and 9.2.22.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145457	1007	-	Addition of new RRM TC 7.1.7 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145464	1008	-	Corrections to RSRP and RSRQ tests	12.3.0	12.4.0
2014-12	RAN#66	R5-145477	1009	-	Corrections to TC 7.3.20 E-UTRAN TDD RL Monitoring Test for In-sync under for feICIC	12.3.0	12.4.0

2014-12	RAN#66	R5-145488	1011	-	Test Tolerances for TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.3.0	12.4.0
2014-12	RAN#66	R5-145489	1012	-	Test Tolerances for TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.3.0	12.4.0
2014-12	RAN#66	R5-145493	1013	-	Uncertainties and Test Tolerances to Annex F for feICIC RRM test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145501	1014	-	Correction to periodicity of ABS pattern in RRM for feICIC	12.3.0	12.4.0
2014-12	RAN#66	R5-145512	1015	-	Alignment of Annex I	12.3.0	12.4.0
2014-12	RAN#66	R5-145528	1017	-	Editorial removal of brackets from TC 7.3.15	12.3.0	12.4.0
2014-12	RAN#66	R5-145587	1018	-	Update of feICIC Out-Of-Sync test cases with assistance data	12.3.0	12.4.0
2014-12	RAN#66	R5-145639	1019	-	Updates to RRM feICIC test cases in Clause 9	12.3.0	12.4.0
2014-12	RAN#66	R5-145801	1020	-	RRM: Modification of test description to refer to State 2A-RF	12.3.0	12.4.0
2014-12	RAN#66	R5-145802	1021	-	Update of Annex E cell configuration mapping for feICIC	12.3.0	12.4.0
2014-12	RAN#66	R5-145816	1022	-	Updates to RRM TC 7.1.3 and 7.1.4	12.3.0	12.4.0
2014-12	RAN#66	R5-145817	1023	-	Correction to the band group in 9.2.1.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145819	1024	-	Correction to 8.16.6	12.3.0	12.4.0
2014-12	RAN#66	R5-145820	1025	-	Correction to Phys Cell Id of MeasResult in RRM test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145831	1026	-	Uncertainties and Test Tolerances for feICIC Test cases 7.3.17, 7.3.18, 7.3.19, 7.3.20, 7.3.21, 7.3.22	12.3.0	12.4.0
2014-12	RAN#66	R5-145832	1027	-	Uncertainties and Test Tolerances for feICIC test cases 9.1.14.1 and 9.1.15.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145837	1028	-	Uncertainties and Test Tolerances for feICIC test cases 9.1.14.2 and 9.1.15.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145877	1029	-	Addition of new TCs for activation and deactivation of known SCell	12.3.0	12.4.0
2014-12	RAN#66	R5-145878	1030	-	Update to test procedure for LTE CA Event reporting test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145906	1031	-	Addition of new RRM TC 6.2.7 E-UTRAN FDD - Non-Contention Based Random Access Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145907	1032	-	Addition of new RRM TC 6.2.8 E-UTRAN TDD - Non-Contention Based Random Access Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145908	1033	-	Addition of new RRM TC 7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145909	1034	-	Addition of new RRM TC 7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145910	1035	-	Addition of new RRM TC 7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145911	1036	-	Updates to CA TCs about 10+5MHz and 5+5MHz BW	12.3.0	12.4.0
2014-12	RAN#66	R5-145912	1037	-	New TCs 9.1.12 for FDD RSRP Accuracy for CA 20MHz	12.3.0	12.4.0
2014-12	RAN#66	R5-145913	1038	-	New TCs 9.2.11 for FDD RSRQ Accuracy for CA 20MHz	12.3.0	12.4.0
2014-12	RAN#66	R5-145915	1039	-	Correction to measurement performance test cases 9.3.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145918	1040	-	Update of Annex H for feICIC test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145919	1041	-	Update of feICIC RLM In-sync test cases with assistance data	12.3.0	12.4.0
2014-12	RAN#66	R5-145927	1042	-	Correction to the test procedure in 9.6.1 and 9.6.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145977	0999	-	CA-RRM: Review of test frequencies in Annex E	12.3.0	12.4.0
2014-12	RAN#66	R5-145982	1010	-	Cell mapping for some RRM TCs	12.3.0	12.4.0
2015-01	-	-	-	-	Re-implementation of R5-145927	12.4.0	12.4.1
2015-01	-	-	-	-	Re-implementation of R5-145911	12.4.0	12.4.1
2015-03	RAN#67	R5-150213	1043	-	Corrections to multicarrier handover from E-UTRA to UTRA requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150218	1044	-	Test Tolerances for 4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection	12.4.1	12.5.0
2015-03	RAN#67	R5-150220	1045	-	Test Tolerance for 4.3.4.3 EUTRA TDD-UTRA TDD cell reselection	12.4.1	12.5.0
2015-03	RAN#67	R5-150222	1046	-	Test Tolerances for 8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150224	1047	-	Test Tolerances for 8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150226	1048	-	Test Tolerances for 8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150228	1049	-	Test Tolerances for 8.8.1+8.10.1 E-UTRAN - GSM event triggered reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150230	1050	-	Test Tolerances for 8.8.2+8.10.2 E-UTRAN - GSM event triggered reporting when DRX is used	12.4.1	12.5.0
2015-03	RAN#67	R5-150232	1051	-	Uncertainties to Annex F for RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150242	1052	-	Update Uncertainties for Test case 5.1.5	12.4.1	12.5.0
2015-03	RAN#67	R5-150244	1053	-	Update Uncertainties for Test case 5.1.6	12.4.1	12.5.0
2015-03	RAN#67	R5-150246	1054	-	Update Uncertainties for Test case 5.2.3, 5.2.6	12.4.1	12.5.0

2015-03	RAN#67	R5-150256	1055	-	Introduction of Test Cases for RSRQ Accuracy for TDD-FDD CA	12.4.1	12.5.0
2015-03	RAN#67	R5-150306	1056	-	Uncerts and Test Tools for TCs 8.16.11+8.16.12 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150310	1057	-	Uncerts and Test Tools for TCs 8.16.15+8.16.16 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150314	1058	-	Uncerts and Test Tools for TCs 9.1.18.2+9.1.19.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150316	1059	-	Uncerts and Test Tools for TCs 9.1.20.1+9.1.21.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150318	1060	-	Uncerts and Test Tools for TCs 9.1.20.2+9.1.21.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150320	1061	-	RRM: Corrections to event triggered tests without measurement gap	12.4.1	12.5.0
2015-03	RAN#67	R5-150324	1062	-	Uncerts and Test Tools for TCs 9.2.23.1+9.2.24.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150327	1063	-	Uncerts and Test Tools for TCs 9.2.23.2+9.2.24.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150328	1064	-	Correction to RRM TCs 9.1.6.2 and 9.1.7.2	12.4.1	12.5.0
2015-03	RAN#67	R5-150361	1065	-	Addition of cell mapping for some test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150381	1066	-	Update of Annex E and F for TCs 9.1.12 and 9.2.11	12.4.1	12.5.0
2015-03	RAN#67	R5-150390	1067	-	Correction to test procedure for LTE CA event reporting test case	12.4.1	12.5.0
2015-03	RAN#67	R5-150421	1068	-	Correction to message exceptions in eICIC MBSFN ABS	12.4.1	12.5.0
2015-03	RAN#67	R5-150423	1069	-	Correction to feICIC common exceptions in Annex H	12.4.1	12.5.0
2015-03	RAN#67	R5-150424	1070	-	Clean up on cl.7 and cl.8 feICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150425	1071	-	Clean up on cl.9 feICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150517	1072	-	Error correction to TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	12.4.1	12.5.0
2015-03	RAN#67	R5-150523	1073	-	Cell configuration mapping for Rel 12 and forward absolute RSRP accuracy RRM cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150526	1074	-	Update R8 intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150527	1075	-	Update R8 inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150529	1076	-	Update R9 inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150530	1077	-	Update R10 intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150531	1078	-	Update TDD RSRP Accuracy requirements for Carrier Aggregation	12.4.1	12.5.0
2015-03	RAN#67	R5-150806	1079	-	New TCs: intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150807	1080	-	New TCs: inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150808	1081	-	New TCs: RSRP absolute accuracy for E-UTRA CA	12.4.1	12.5.0
2015-03	RAN#67	R5-150812	1082	-	New TC: E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150813	1083	-	New TC: E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	12.4.1	12.5.0
2015-03	RAN#67	R5-150814	1084	-	New TC: TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150815	1085	-	New TC: TDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150841	1086	-	Corrections to on time to identify the target UTRA TDD cell for blind redirection	12.4.1	12.5.0
2015-03	RAN#67	R5-150842	1087	-	Update of TCs 9.1.12 for FDD RSRP Accuracy for CA 20MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150843	1088	-	Update TCs 9.2.11 for FDD RSRQ Accuracy for CA 20MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150844	1089	-	Correction to eICIC Radio link monitoring test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150845	1090	-	Clean up on cl.7 and cl.9 eICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150847	1092	-	Update R11 RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150852	1093	-	Uncerts and Test Tools for TCs 8.16.13+8.16.14 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150856	1094	-	Uncerts and Test Tools for TCs 8.16.9+8.16.10 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150857	1104	-	RRM: Inter-frequency testing for Band 30	12.4.1	12.5.0
2015-03	RAN#67	R5-150884	1095	-	Cell configuration mapping for 20MHz +10MHz CA RRM new cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150885	1096	-	Editorial correction to 8.14.2 and 8.15.2	12.4.1	12.5.0
2015-03	RAN#67	R5-150886	1097	-	Corrections to RRM test cases in clauses 5 and 8	12.4.1	12.5.0

2015-03	RAN#67	R5-150887	1098	-	Uncerts and Test Tools for TCs 9.1.18.1+9.1.19.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150901	1099	-	CA RRM: Correction to test frequencies and Cell-IDs	12.4.1	12.5.0
2015-03	RAN#67	R5-150902	1100	-	Addition of CA capability in RRM tests	12.4.1	12.5.0
2015-03	RAN#67	R5-150903	1101	-	feICIC RRM: Corrections to Cell-IDs	12.4.1	12.5.0
2015-03	RAN#67	R5-150930	1102	-	RRM: Consideration of unsent measurement reports	12.4.1	12.5.0
2015-03	RAN#67	R5-150908	1103	-	Updates of test procedures in activation and deactivation test cases	12.4.1	12.5.0
2015-06	RAN#68	R5-151126	1107	-	RRM: Corrections to message configuration of TCs 9.3.2 and 9.4.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151127	1108	-	RRM: Corrections to test procedures of TCs 9.3.x and 9.4.x	12.5.0	12.6.0
2015-06	RAN#68	R5-151128	1109	-	CA RRM: Corrections to TC 9.1.24.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151133	1111	-	Uncertainties and Test tolerances for Test cases 9.9.1.1 and 9.9.2.1	12.5.0	12.6.0
2015-06	RAN#68	R5-151135	1112	-	Uncertainties and Test tolerances for Test cases 9.9.1.2 and 9.9.2.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151197	1122	-	Corrections to CPICH Ec/No to CPICH Ec/Io in EUTRA FDD to UTRA FDD HO	12.5.0	12.6.0
2015-06	RAN#68	R5-151277	1129	-	Correction to RRM test case 8.2.4	12.5.0	12.6.0
2015-06	RAN#68	R5-151278	1130	-	Correction to RRM test case 8.11.4	12.5.0	12.6.0
2015-06	RAN#68	R5-151330	1150	-	Addition of band 32 to TS36.521-3	12.5.0	12.6.0
2015-06	RAN#68	R5-151464	1155	-	Correction to applicability of TD-LTE to UTRA TDD periodic measurements	12.5.0	12.6.0
2015-06	RAN#68	R5-151485	1158	-	Update of eICIC meas pattern for PCell, TC 8.2.5	12.5.0	12.6.0
2015-06	RAN#68	R5-151542	1162	-	Uncerts and Test Tools for TC 8.16.21 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151544	1163	-	Uncerts and Test Tools for TC 8.16.22 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151546	1164	-	Uncerts and Test Tools for TCs 9.1.24.1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151548	1165	-	Uncerts and Test Tools for TCs 9.1.24.1_1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151550	1166	-	Uncerts and Test Tools for TC 9.1.24.2 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151552	1167	-	Uncerts and Test Tools for TC 9.2.27.1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151554	1168	-	Uncerts and Test Tools for TC 9.2.27.2 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151830	1105	1	RRM: Consideration of unsent measurement reports in recently added test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151831	1113	1	Test Tolerances for 8.3.1+8.3.2+8.14.1+8.14.2 inter-frequency event triggered reporting under fading propagation conditions	12.5.0	12.6.0
2015-06	RAN#68	R5-151832	1115	1	Test Tolerances for 8.4.1+8.4.2+8.15.1+8.15.2 inter-frequency event triggered reporting under fading propagation conditions	12.5.0	12.6.0
2015-06	RAN#68	R5-151833	1117	1	Test Tolerances for 9.2.4A.1 Absolute Accuracy RSRQ	12.5.0	12.6.0
2015-06	RAN#68	R5-151834	1119	1	Test Tolerances for 9.2.4A.2 Relative Accuracy RSRQ	12.5.0	12.6.0
2015-06	RAN#68	R5-151835	1121	1	Uncertainties to Annex F for above 3GHz RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151838	1127	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 4.2.3, 4.2.4, 4.2.5, 4.2.6	12.5.0	12.6.0
2015-06	RAN#68	R5-151844	1128	1	Uncertainties and Test Tolerances for Rel-12 Improved RSRP accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151846	1159	1	Update Uncerts and Test Tools for TCs 8.11.1+8.11.2 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151848	1160	1	Update Uncerts and Test Tools for TC 8.11.3 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151850	1161	1	Update Uncerts and Test Tools for TC 8.11.4 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151861	1171	1	Addition of new RRM TC 8.16.25 E-UTRAN TDD-FDD CA Event Triggered Reporting on Deactivated SCell with PCell interruption in Non-DRX with PCell in FDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151862	1172	1	Addition of new RRM TC 8.16.26 E-UTRAN TDD-FDD CA Event Triggered Reporting on Deactivated SCell with PCell interruption in Non-DRX with PCell in TDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151864	1123	1	Corrections to RRM test cases for Core Alignment	12.5.0	12.6.0
2015-06	RAN#68	R5-151866	1132	1	New TC: E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151867	1133	1	New TC: E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151868	1134	1	New TC: E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151869	1135	1	Cell configuration mapping for Rel 12 and forward RSRP relative accuracy RRM cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151870	1136	1	Cell configuration mapping for Rel 12 and forward FDD absolute RSRP accuracy RRM cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151871	1137	1	New TCs: R12 RSRP accuracy in eICIC	12.5.0	12.6.0

2015-06	RAN#68	R5-151872	1138	1	New TCs: R12 RSRP accuracy in FeICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-151873	1139	1	New TCs: RSRP absolute accuracy for FDD E-UTRA CA	12.5.0	12.6.0
2015-06	RAN#68	R5-151874	1140	1	New TCs: R12 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151875	1141	1	Update of R12 CA RSRP measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151876	1142	1	Update of R12 RSRP inter frequency measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151877	1143	1	Update of R12 RSRP intra frequency measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151878	1144	1	Update test applicabilities for R8 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151879	1145	1	Update test applicabilities for R9 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151880	1146	1	Update test applicabilities of R10 RSRP measurement accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151882	1147	1	Update test applicabilities of R11 RSRP measurement accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151883	1148	1	Update FDD CA RSRP Accuracy requirements	12.5.0	12.6.0
2015-06	RAN#68	R5-151904	1174	1	Correction to the titles of 2UL CA RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151905	1149	1	Correction of allowed CQI report delays in sCell Activation Tests	12.5.0	12.6.0
2015-06	RAN#68	R5-151906	1154	1	Correction to feICIC Radio link monitoring test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151915	1153	1	Correction to test case 9.2.10.1 of 36.521-3	12.5.0	12.6.0
2015-06	RAN#68	R5-151916	1175	1	Correction to FeICIC measurement performance test cases and Annex H.3	12.5.0	12.6.0
2015-06	RAN#68	R5-151917	1177	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.1	12.5.0	12.6.0
2015-06	RAN#68	R5-151918	1178	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151923	1169	1	Addition of new RRM TC 8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151924	1170	1	Addition of new RRM TC 8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151925	1173	1	Applicability for newly added TDD-FDD CA RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151939	1152	1	Addition of FDD-TDD RSRP accuracy test cases for FDD-TDD CA.	12.5.0	12.6.0
2015-06	RAN#68	R5-152010	1151	1	Correction to RLM test in feICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-152015	1126	2	Corrections to Derivation of Test Requirements for above 3GHz RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-152130	1110	1	CA RRM: Corrections to cell configuration mapping table	12.5.0	12.6.0
2015-06	RAN#68	R5-152131	1156	1	Correction to Event Triggered Reporting test in feICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-152134	1157	2	Clarification of 2DL CA RRM inter-frequency tests with smaller channels bandwidth	12.5.0	12.6.0
2015-09	RAN#69	R5-153094	1183	-	Addition of cell configuration mapping for RRM test cases 8.16.17 and 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153095	1184	-	Correction of cell configuration mapping for RRM cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153096	1185	-	Correction of RMC used in UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	12.6.0	12.7.0
2015-09	RAN#69	R5-153164	1193	-	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell for 20MHz + 10MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153167	1194	-	Cell configuration mapping for newly introduced 20+20MHz and 20+10MHz cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153176	1197	-	Addition of missing titles to section 8 RRM test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153177	1198	-	Update Test Tolerances and Test requirements for Test case 4.3.1.1	12.6.0	12.7.0
2015-09	RAN#69	R5-153179	1199	-	Update Test Tolerances and Test requirements for Test case 4.3.4.1	12.6.0	12.7.0
2015-09	RAN#69	R5-153181	1200	-	Update Test Tolerances and Test requirements for Test cases 5.1.3+5.1.4+5.1.7+5.1.8	12.6.0	12.7.0
2015-09	RAN#69	R5-153249	1204	-	CA RRM: Clarification of PHICH configuration	12.6.0	12.7.0
2015-09	RAN#69	R5-153250	1205	-	RRM: Minor correction to TC 8.7.2	12.6.0	12.7.0
2015-09	RAN#69	R5-153251	1206	-	Uncertainties and Test tolerances for TS 36.521-3 Test case 8.20.2B	12.6.0	12.7.0
2015-09	RAN#69	R5-153310	1209	-	Correction of L2G PSHO applicability for TS 36.521-3 spec	12.6.0	12.7.0
2015-09	RAN#69	R5-153357	1210	-	Correction to RLM tests for eICIC	12.6.0	12.7.0
2015-09	RAN#69	R5-153358	1211	-	Correction to initial conditions in event triggered reporting tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153359	1212	-	Correction to RSRP and RSRQ test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153387	1215	-	Correction to applicability of feICIC RRM test cases.	12.6.0	12.7.0
2015-09	RAN#69	R5-153461	1222	-	New TC: 8.20.2A for RRM	12.6.0	12.7.0

2015-09	RAN#69	R5-153471	1226	-	Update of test applicabilites for Rel-10 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153473	1227	-	Update of test applicabilites for Rel-11 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153475	1228	-	Update of Annex E for RRM 9.1.6.2_1 and 9.1.7.2_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153532	1233	-	Update Uncertainties for Test case 5.2.7	12.6.0	12.7.0
2015-09	RAN#69	R5-153544	1234	-	Update Uncertainties for Test cases 5.2.8 and 5.2.9	12.6.0	12.7.0
2015-09	RAN#69	R5-153547	1235	-	Update Uncertainties for Test case 5.2.10	12.6.0	12.7.0
2015-09	RAN#69	R5-153553	1236	-	Correction to 8.16.17 and 8.16.18 activation and deactivation of known Scell	12.6.0	12.7.0
2015-09	RAN#69	R5-153687	1239	-	Uncerts and Test Tools for TCs 7.1.3+7.1.4 36.521-3 CR	12.6.0	12.7.0
2015-09	RAN#69	R5-153688	1240	-	Cell mapping for new RRM TCs 7.1.3_1+7.1.4_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153812	1190	1	New TC: E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153814	1224	1	New TCs: FDD Rel-12 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153815	1225	1	New TCs: TDD Rel-12 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153816	1241	1	Addition of new RRM TCs 7.1.3_1+7.1.4_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153818	1186	1	Correction of descriptions for test cases 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153819	1187	1	Update editor's note for RRM test case 8.16.17 and 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153829	1201	1	Introduction of 3DL CA Event triggered reporting Test cases 8.16.27 and 8.16.28	12.6.0	12.7.0
2015-09	RAN#69	R5-153830	1202	1	Introduction of 3DL CA RSRP accuracy Test cases 9.1.37 and 9.1.38	12.6.0	12.7.0
2015-09	RAN#69	R5-153831	1203	1	Introduction of 3DL Pcell in FDD RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153832	1207	1	Addition of new TC of 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153833	1208	1	Addition of new TC of 3 DL FDD RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153834	1217	1	Updates to RRM TCs 8.16.23, 8.16.24, 8.16.25 and 8.16.26	12.6.0	12.7.0
2015-09	RAN#69	R5-153871	1229	1	New TCs: 9.1.40 and 9.1.40_1 TDD RSRP Accuracy for 3DL CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153872	1230	1	New TCs: 9.2.39 TDD RSRQ Accuracy for 3DL CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153898	1218	1	Addition of new TC 8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD	12.6.0	12.7.0
2015-09	RAN#69	R5-153899	1219	1	Addition of new TC 8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	12.6.0	12.7.0
2015-09	RAN#69	R5-153900	1220	1	Addition of new TC 8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-153901	1221	1	Addition of new TC 8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-153930	1188	1	New TC: E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +20 MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153931	1189	1	New TC: E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +10 MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153934	1195	1	Correction to applicability of TD-LTE to UTRA TDD connected mode measurements	12.6.0	12.7.0
2015-09	RAN#69	R5-153936	1191	1	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz + 20MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153937	1192	1	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz + 10MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153938	1196	1	Correction to cell mapping of eICIC Chapter 9 test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153939	1213	1	Clarification of neighbour cell frequency for intra-band non-contiguous CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153940	1223	1	Update of minimum requirements for relative RSRP Accuracy TC 9.1.6.2 and 9.1.7.2	12.6.0	12.7.0
2015-09	RAN#69	R5-153943	1238	1	Introduction of new 3DL CA Test cases 8.16.30	12.6.0	12.7.0
2015-09	RAN#69	R5-154000	1179	1	Introduction of TC 8.16.38 3DL TDD CA activation and deactivation of known SCell in non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-154001	1182	1	Introduction of 3 DL TDD Absolute/Relative RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-154028	1214	1	Update of Annex E for 3DL CA RRM	12.6.0	12.7.0
2015-09	RAN#69	R5-154029	1237	2	Introduction of new 3DL CA Test cases 8.16.29	12.6.0	12.7.0
2015-09	RAN#69	R5-154033	1242	1	Correction to relative measurement test cases of feICIC RRM test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-154049	1243	-	CA RRM: Additions to cell mapping Table E-1	12.6.0	12.7.0

2015-09	RAN#69	R5-154058	1244	-	eICIC RRM: Corrections to cell mapping Table E-1	12.6.0	12.7.0
2015-12	RAN#70	R5-155108	1258	-	Correction to test procedure of inter-frequency autonomous gaps test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155134	1262	-	Updating Annex E and F with newly introduced test cases for MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155135	1263	-	Adding RMCs for MTC to Annex A	12.7.0	12.8.0
2015-12	RAN#70	R5-155136	1264	-	Adding abbreviations and SS HD-FDD testing information	12.7.0	12.8.0
2015-12	RAN#70	R5-155139	1266	-	Uncertainties and Test tolerances for Test cases 4.3.2 and 4.3.4.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155141	1267	-	Uncertainties and Test tolerances for Test cases 4.4.1 and 4.4.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155143	1268	-	Uncertainties and Test tolerances for Test cases 4.5.1.1 and 4.5.2.1	12.7.0	12.8.0
2015-12	RAN#70	R5-155145	1269	-	Uncertainties and Test tolerances for Test case 8.20.2A	12.7.0	12.8.0
2015-12	RAN#70	R5-155147	1270	-	Uncertainties and Test tolerances for Test case 8.20.4A	12.7.0	12.8.0
2015-12	RAN#70	R5-155149	1271	-	Uncertainties and Test tolerances for Test case 8.20.4B	12.7.0	12.8.0
2015-12	RAN#70	R5-155197	1286	-	Uncertainties and Test Tolerance for E-UTRAN TDD – UE Timing Advanced Adjustment Accuracy Test for SCell in sTAG	12.7.0	12.8.0
2015-12	RAN#70	R5-155270	1297	-	Correction to test case 7.1.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155399	1304	-	Addition of cell configuration mapping for newly introduced MTC tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155427	1305	-	Uncertainties and Test Tolerances for 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	12.7.0	12.8.0
2015-12	RAN#70	R5-155429	1307	-	Update to 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	12.7.0	12.8.0
2015-12	RAN#70	R5-155437	1310	-	Removable of wait time after activation of Scell	12.7.0	12.8.0
2015-12	RAN#70	R5-155574	1319	-	Incorrect Io values for eICIC tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155680	1328	-	Adding new RRM test case 8.16.35 for 3DL CA	12.7.0	12.8.0
2015-12	RAN#70	R5-155681	1329	-	Adding new RRM test case 8.16.36 for 3DL CA	12.7.0	12.8.0
2015-12	RAN#70	R5-155770	1330	-	Introduction of test case 9.1.41.1 - FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155771	1331	-	Introduction of test case 9.1.41.2 - FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155772	1332	-	Introduction of test case 9.1.42.1 - HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155773	1333	-	Introduction of test case 9.1.42.2 - HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155774	1334	-	Introduction of test case 9.1.43.1 - TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155775	1335	-	Introduction of test case 9.1.43.2 - TDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155776	1336	-	Introduction of cell configuration mapping for Intra Frequency RSRP Accuracy for UE category 0 Test Cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155805	1256	1	Update minimum requirements for test case 8.1.1	12.7.0	12.8.0
2015-12	RAN#70	R5-155806	1265	1	Updating and aligning of RMC tables in TS36.521-3	12.7.0	12.8.0
2015-12	RAN#70	R5-155820	1250	1	Introduction of new test case 6.1.8 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155821	1252	1	Introduction of new test case 8.1.12 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155822	1253	1	Introduction of new test case 8.1.13 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155823	1254	1	Introduction of new test case 8.1.17 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155824	1255	1	Introduction of new test case 8.1.18 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155825	1259	1	Adding new MTC handover test case 5.1.10	12.7.0	12.8.0
2015-12	RAN#70	R5-155826	1260	1	Adding new MTC handover test case 5.1.11	12.7.0	12.8.0
2015-12	RAN#70	R5-155827	1261	1	Adding new MTC handover test case 5.1.12	12.7.0	12.8.0
2015-12	RAN#70	R5-155828	1272	1	Adding new MTC FD-FDD RLM test case for out-of-sync and definition update	12.7.0	12.8.0
2015-12	RAN#70	R5-155829	1273	1	Adding new MTC FD-FDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155830	1274	1	Adding new MTC FD-FDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155831	1275	1	Adding new MTC FD-FDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155832	1276	1	Adding new MTC HD-FDD RLM test case for out-of-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155833	1277	1	Adding new MTC HD-FDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155834	1278	1	Adding new MTC HD-FDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155835	1279	1	Adding new MTC HD-FDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155836	1280	1	Adding new MTC TDD RLM test case for out-of-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155837	1281	1	Adding new MTC TDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155838	1282	1	Adding new MTC TDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155839	1283	1	Adding new MTC TDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155862	1284	1	Update to RSRP accuracy test cases for FDD-TDD CA	12.7.0	12.8.0

2015-12	RAN#70	R5-155863	1299	1	Update of message contents for 3DL CA RSRP and RSRQ Accuracy tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155864	1309	1	Correction to test applicability in 3DL CA RRM test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155866	1315	1	Clarification on frequency swapping and references to connection diagrams in 3DL CA RRM test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155867	1316	1	Addition of missing applicability release to test case 9.2.39	12.7.0	12.8.0
2015-12	RAN#70	R5-155868	1320	1	Introduction of new 3DL CA RRM test case TC 8.16.41 “3 DL FDD CA activation and deactivation of unknown SCell in non-DRX”	12.7.0	12.8.0
2015-12	RAN#70	R5-155869	1327	1	Updating 3DL CA test cases 8.16.29 and 8.16.30	12.7.0	12.8.0
2015-12	RAN#70	R5-155878	1288	1	Uncertainties and Test Tolerances for 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155879	1290	1	Uncertainties and Test Tolerances for 3DL E-UTRA for Carrier Aggregation RSRQ Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155880	1321	1	Uncerts and Test Tools for TCs 8.16.31+8.16.32+8.16.33+8.16.34 36.521-3 CR	12.7.0	12.8.0
2015-12	RAN#70	R5-155881	1257	1	Updated to TC 7.1.4A	12.7.0	12.8.0
2015-12	RAN#70	R5-155888	1285	1	Update RSRQ and reported values for serving cell Intra Frequency Absolute RSRQ Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155889	1287	1	Uncertainties and Test Tolerances for 2DL CA activation and deactivation of known SCell in non-DRX Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155896	1293	1	Add new LC MTC test case 8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155897	1294	1	Add new LC MTC test case 8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0.	12.7.0	12.8.0
2015-12	RAN#70	R5-155898	1295	1	Add new LC MTC test case 8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155899	1296	1	Add new LC MTC test case 8.1.22 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156009	1298	1	Update Test applicability for test case 7.1.7 and 7.2.5	12.7.0	12.8.0
2015-12	RAN#70	R5-156015	1326	1	Addition of UE transmit timing accuracy test case for PRoSe Direct discovery.	12.7.0	12.8.0
2015-12	RAN#70	R5-156032	1289	1	Uncertainties and Test Tolerances for 3DL E-UTRA for Carrier Aggregation RSRP Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-156033	1308	1	Update of Annex E for 3DL CA RRM	12.7.0	12.8.0
2015-12	RAN#70	R5-156034	1311	1	Correction to 3DL CA RSRP/RSRQ test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-156051	1251	1	Introduction of new test case 8.1.11 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-156053	1291	1	Add new LC MTC test case 6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156054	1292	1	Add new LC MTC test case 6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156067	1322	1	Addition of new SCE-L1 RRM TC 8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156068	1323	1	Addition of new SCE-L1 RRM TC 8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156069	1324	1	Addition of new SCE-L1 RRM TC 8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156070	1325	1	Addition of new SCE-L1 RRM TC 8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156128	1313	1	Correction to message contents for RRM 3DL CA TC 9.2.41	12.7.0	12.8.0
2015-12	RAN#70	R5-156129	1314	1	Corrections to message contents for RRM 3DL CA TCs 8.16.27+8.16.28	12.7.0	12.8.0
2015-12	RAN#70	R5-156137	1301	2	Update of test applicabilities for R12 RRM cases in 36.521-3	12.7.0	12.8.0
2016-03	RAN#71	R5-160121	1346	-	Updates and Test Tolerances for 2DL FDD-TDD E-UTRA for Carrier Aggregation RSRP Accuracy Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160191	1349	-	Updates and Test Tolerances for 2DL E-UTRA for Carrier Aggregation RSRQ Accuracy Test cases	12.8.0	12.9.0

2016-03	RAN#71	R5-160200	1350	-	Band 66 update of 3DL E-UTRA for CA RSRP Accuracy Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160204	1351	-	Correction to test case 8.20.2B	12.8.0	12.9.0
2016-03	RAN#71	R5-160207	1353	-	Correction to test case 8.16.17 and 8.16.18	12.8.0	12.9.0
2016-03	RAN#71	R5-160221	1356	-	Uncertainties and TT for 8.16.23 and 8.16.24 TDD-FDD CA event triggered reporting under deactivated SCell in non-DRX with PCell in FDD/TDD 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160222	1357	-	Uncertainties and TT for 8.16.25 and 8.16.26 TDD-FDD CA event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD/TDD 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160237	1358	-	Condition definitions for discovery measurements and measurement accuracy requirements	12.8.0	12.9.0
2016-03	RAN#71	R5-160257	1363	-	Addition of new SCE-L1 RRM TC 8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160258	1364	-	Addition of new SCE-L1 RRM TC 8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160261	1367	-	Addition of new SCE-L1 RRM TC 9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160262	1368	-	Addition of new SCE-L1 RRM TC 9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160263	1369	-	Addition of new SCE-L1 RRM TC 9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160264	1370	-	Addition of new SCE-L1 RRM TC 9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160265	1371	-	Addition of new SCE-L1 RRM TC 9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160266	1372	-	Addition of new SCE-L1 RRM TC 9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160267	1373	-	Addition of new SCE-L1 RRM TC 9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160268	1374	-	Addition of new SCE-L1 RRM TC 9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160269	1375	-	Addition of new SCE-L1 RRM TC 9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160270	1376	-	Addition of new SCE-L1 RRM TC 9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160271	1377	-	Addition of new SCE-L1 RRM TC 9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160272	1378	-	Addition of new SCE-L1 RRM TC 9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160443	1382	-	Introduction of new Dual Connectivity test case 8.23.1	12.8.0	12.9.0
2016-03	RAN#71	R5-160444	1383	-	Introduction of new Dual Connectivity test case 8.23.2	12.8.0	12.9.0
2016-03	RAN#71	R5-160445	1384	-	Introduction of new Dual Connectivity test case 8.23.3	12.8.0	12.9.0
2016-03	RAN#71	R5-160446	1385	-	Introduction of new Dual Connectivity test case 8.23.4	12.8.0	12.9.0
2016-03	RAN#71	R5-160447	1386	-	Introduction of new Dual Connectivity test case 8.23.5	12.8.0	12.9.0
2016-03	RAN#71	R5-160448	1387	-	Introduction of new Dual Connectivity test case 8.23.6	12.8.0	12.9.0
2016-03	RAN#71	R5-160450	1389	-	Update to MTC test cases 8.1.11, 8.1.12, 8.1.13, 8.1.17, 8.1.18	12.8.0	12.9.0
2016-03	RAN#71	R5-160452	1391	-	Update to test cases 8.16.17	12.8.0	12.9.0
2016-03	RAN#71	R5-160497	1397	-	Correction to event triggered tests without measurement gaps	12.8.0	12.9.0
2016-03	RAN#71	R5-160498	1398	-	Correction to RLM tests in feICIC	12.8.0	12.9.0
2016-03	RAN#71	R5-160556	1405	-	CA RRM: Inconsistent message contents in 3CC event triggered tests	12.8.0	12.9.0
2016-03	RAN#71	R5-160558	1407	-	CA RRM: Missing message contents in 3CC TCs 9.1.37 and 9.1.38	12.8.0	12.9.0
2016-03	RAN#71	R5-160559	1408	-	RRM: Correction of applicability of TCs 9.3.2 and 9.4.2	12.8.0	12.9.0
2016-03	RAN#71	R5-160572	1409	-	Updating TS36.521-3 clause 3.5.1 for band 66	12.8.0	12.9.0
2016-03	RAN#71	R5-160574	1410	-	Updating Annex I with band group FDD_B	12.8.0	12.9.0

2016-03	RAN#71	R5-160610	1416	-	Antenna configuration principle for 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160702	1417	-	Introducing DC RRM test case 7.3.38	12.8.0	12.9.0
2016-03	RAN#71	R5-160703	1418	-	Introducing DC RRM test case 7.3.39	12.8.0	12.9.0
2016-03	RAN#71	R5-160704	1419	-	Introducing DC RRM test case 7.3.40	12.8.0	12.9.0
2016-03	RAN#71	R5-160705	1420	-	Updating References, Definitions and Abbreviations for DC in 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160821	1361	1	Addition of new SCE-L1 RRM TC 8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160822	1362	1	Addition of new SCE-L1 RRM TC 8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160823	1365	1	Addition of new SCE-L1 RRM TC 8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160824	1366	1	Addition of new SCE-L1 RRM TC 8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160833	1406	1	CA RRM: Ambiguous description of relative RSRQ measurements in 3CC tests	12.8.0	12.9.0
2016-03	RAN#71	R5-160834	1395	1	Correction to test frequency configuration for 3DL CA RRM	12.8.0	12.9.0
2016-03	RAN#71	R5-160847	1352	1	Correction to test case 7.1.4 and 7.1.4_1	12.8.0	12.9.0
2016-03	RAN#71	R5-160872	1402	1	Updating Annex F for E-UTRAN 3DL CA Activation and Deactivation of Known SCell in Non-DRX test cases in TS36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160876	1388	1	Uncertainties and Test Tolerances for E-UTRAN UE Transmit Timing Accuracy Tests for SCell in sTAG in FDD/TDD Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160883	1390	1	Update to RRM test cases 7.1.3, 7.1.3_1, 7.1.4, 7.1.4_1, 7.1.4A for TT and Uncerts	12.8.0	12.9.0
2016-03	RAN#71	R5-160884	1414	1	Update of HO testcases for MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-160886	1339	2	Introduction of TC 8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-160887	1338	2	Add new LC MTC test case 8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160888	1340	2	Introduction of TC 8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160889	1341	2	Introduction of TC 8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160890	1342	2	Introduction of TC 8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160891	1343	2	Introduction of TC 9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160892	1344	2	Introduction of TC 9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160893	1345	2	Introduction of TC 9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160894	1415	1	Update of RLM testcases for MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-161002	1394	1	Correction to RRC message exceptions for 3DL CA RSRP/RSRQ	12.8.0	12.9.0
2016-03	RAN#71	R5-161007	1403	1	Addition of test cases for transmission timing accuracy and Interruptions for D2D	12.8.0	12.9.0
2016-03	RAN#71	R5-161037	1359	1	Addition of new RRM TC 8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-161038	1360	1	Addition of new RRM TC 8.22.7 E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX	12.8.0	12.9.0
2016-03	RAN#71	R5-161051	1411	1	Correcting the applicability of test cases 9.5.1 and 9.5.2	12.8.0	12.9.0
2016-03	RAN#71	R5-161068	1392	1	Update to test cases 8.16.17A and 8.16.18A	12.8.0	12.9.0
2016-03	RAN#71	R5-161094	1393	2	Correction to Event Triggered Reporting test under Deactivated SCells	12.8.0	12.9.0
2016-03	RAN#71	R5-161095	1396	2	Correction to 3DL CA with deactivated SCell with PCell and SCell interruptions	12.8.0	12.9.0
2016-03	RAN#71	R5-161096	1400	1	Updating RRM test case 8.16.35	12.8.0	12.9.0

2016-03	RAN#71	R5-161097	1401	2	Updating RRM test case 8.16.36	12.8.0	12.9.0
2016-03	RAN#71	R5-161098	1354	2	New TC 8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	12.8.0	12.9.0
2016-03	RAN#71	R5-161099	1355	2	New TC 8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	12.8.0	12.9.0
2016-03	RAN#71	R5-161100	1380	2	Addition of new test case for 3DL FDD CA activation and deactivation of known cell	12.8.0	12.9.0
2016-03	RAN#71	R5-161106	1347	2	Test Tolerances for TC 8.16.38 3DL TDD CA activation and deactivation of known SCell in non-DRX	12.8.0	12.9.0
2016-03	RAN#71	R5-161117	1379	2	Updates of FDD 2DL CA activation and deactivation test case	12.8.0	12.9.0
2016-03	RAN#71	R5-161118	1399	2	Correction to 9.1.15.1 and 9.1.15.2 RSRP tests for feICIC	12.8.0	12.9.0
2016-03	RAN#71	R5-161122	1413	3	Correction of test procedure for 3DL CA RRM test case TC 8.16.41 “3 DL FDD CA activation and deactivation of unknown SCell in non-DRX”	12.8.0	12.9.0
2016-03	RAN#71	R5-161123	1412	3	Introduction of new 3DL CA RRM test case TC 8.16.42 “3 DL TDD CA activation and deactivation of unknown SCell in non-DRX”	12.8.0	12.9.0
2016-06	RAN#72	R5-162186	1422	-	Editorial correction uplink absolute power measurement in Annex F.1.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162190	1423	-	Update of test tolerance for UE ProSe discovery transmission timing	12.9.0	12.10.0
2016-06	RAN#72	R5-162193	1424	-	Update of Test Tolerance analyses for 7.5.1	12.9.0	12.10.0
2016-06	RAN#72	R5-162278	1425	-	Correction to Table number for using MAC-MainConfig-RBC message	12.9.0	12.10.0
2016-06	RAN#72	R5-162286	1430	-	Update of RRM RLM test cases for Cat 0	12.9.0	12.10.0
2016-06	RAN#72	R5-162288	1431	-	Update of Annex F for Cat 0 RLM test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162310	1432	-	RRM: Correction to TCs 7.1.7A and 7.1.7B	12.9.0	12.10.0
2016-06	RAN#72	R5-162311	1433	-	RRM: Corrections to ri-ConfigIndex in 3CC test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162312	1434	-	RRM: Missing release applicability of inter-mode 3CC test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162313	1435	-	RRM: Clarification of message content in TC 8.16.36	12.9.0	12.10.0
2016-06	RAN#72	R5-162321	1437	-	Addition of test cases for SLSS initiation and cease	12.9.0	12.10.0
2016-06	RAN#72	R5-162330	1439	-	Introduction of TDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162334	1442	-	Correction of 3DL CA RRM test case 8.16.36	12.9.0	12.10.0
2016-06	RAN#72	R5-162336	1443	-	Introduction of TDD-TDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162397	1447	-	Uncertainties and Test tolerances for TS 36.521-3 Test cases 9.1.6.1_1 and 9.1.12.1_1	12.9.0	12.10.0
2016-06	RAN#72	R5-162399	1448	-	Uncertainties and Test tolerances for TS 36.521-3 Test cases 9.1.6.2_1 and 9.1.12.2_1	12.9.0	12.10.0
2016-06	RAN#72	R5-162430	1450	-	Update of RRM test cases 9.1.1.1, 9.1.2.1, 9.1.16.1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162433	1451	-	Update of RRM test cases 9.1.1.1_1, 9.1.2.1_1, 9.1.16.1_1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162436	1452	-	Update of RRM test cases 9.1.1.2, 9.1.2.2, 9.1.16.2 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162439	1453	-	Update of RRM test cases 9.1.3.1, 9.1.4.1, 9.1.17.1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162600	1461	-	Correction to test applicability in 3DL CA activation and deactivation TCs	12.9.0	12.10.0
2016-06	RAN#72	R5-162830	1463	1	Correction to 3DL CA activation and deactivation TCs	12.9.0	12.10.0
2016-06	RAN#72	R5-162831	1454	1	Correction to applicability for EUTRA TDD to UTRA TDD Son test case	12.9.0	12.10.0
2016-06	RAN#72	R5-162833	1438	1	Introduction of FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162834	1441	1	Introduction of FDD-FDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162835	1444	1	Introduction of FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162836	1445	1	Introduction of TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162881	1436	1	Addition of ProSe cell selection test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162891	1421	1	Uncertainties and Test Tolerances for MTC RRM TC 8.1.11, 8.1.12, 8.1.13, 8.1.17 and 8.1.18	12.9.0	12.10.0
2016-06	RAN#72	R5-162894	1429	1	Test Tolerance updates for MTC test cases in clause 6	12.9.0	12.10.0

2016-06	RAN#72	R5-162895	1457	1	Add Test requirements for TS 36.521-3 Test case 8.22.1 and 8.22.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162897	1458	1	Add Test requirements for TS 36.521-3 Test case 8.22.3 and 8.22.4	12.9.0	12.10.0
2016-06	RAN#72	R5-162957	1426	1	Update to Dual Connectivity RRM test case 8.23.4	12.9.0	12.10.0
2016-06	RAN#72	R5-162958	1427	1	Update to Dual Connectivity RRM test case 8.23.5	12.9.0	12.10.0
2016-06	RAN#72	R5-162959	1428	1	Update to Dual Connectivity RRM test case 8.23.6	12.9.0	12.10.0
2016-06	RAN#72	R5-162960	1446	1	Added new clause for Synchronous and Asynchronous DC test principles	12.9.0	12.10.0
2016-06	RAN#72	R5-162961	1456	1	Update to Dual Connectivity RRM test case 8.23.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162962	1467	1	Update to Dual Connectivity RRM test case 8.23.3	12.9.0	12.10.0
2016-06	RAN#72	R5-162963	1468	1	Update of DC RLM test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162964	1469	1	Adding new RLM test case 7.3.41	12.9.0	12.10.0
2016-06	RAN#72	R5-162965	1470	1	Adding new RLM test case 7.3.42	12.9.0	12.10.0
2016-06	RAN#72	R5-162966	1471	1	Adding new RLM test case 7.3.43	12.9.0	12.10.0
2016-06	RAN#72	R5-163111	1455	1	Update to Dual Connectivity RRM test case 8.23.1	12.9.0	12.10.0
2016-06	RAN#72	R5-163128	1459	1	Add Test requirements for TS 36.521-3 Test case 9.1.25 and 9.1.26	12.9.0	12.10.0
2016-06	RAN#72	R5-163197	1462	2	Correction to duration of T3 in 3 DL CA Event Triggered Reporting on Deactivated Scell	12.9.0	12.10.0
2016-06	RAN#72	R5-163134	1464	1	Clean up on RRM test cases in chapter 7, 8, 9	12.9.0	12.10.0
2016-06	RAN#72	R5-163135	1465	1	Correction to event triggered reporting under deactivated SCell(10MHz+5MHz and 20MHz+10MHz)	12.9.0	12.10.0
2016-09	RAN#73	R5-165130	1472	-	Parameter correction for TC 9.2.16.1	12.10.0	12.11.0
2016-09	RAN#73	R5-165166	1477	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.3.1_1 and 9.1.4.1_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165168	1478	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.3.2_1 and 9.1.4.2_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165296	1482	-	Band 66 update of Inter-freq relative RSRP accuracy Test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165389	1490	-	Update of test tolerance for UE ProSe direct communication transmission timing	12.10.0	12.11.0
2016-09	RAN#73	R5-165428	1494	-	Modification of measurement report configuration for TC 8.1.8 and 8.2.6	12.10.0	12.11.0
2016-09	RAN#73	R5-165527	1496	-	Add Test requirements for TS 36.521-3 Test case 8.22.9 and 8.22.10	12.10.0	12.11.0
2016-09	RAN#73	R5-165528	1497	-	Add Test requirements for TS 36.521-3 Test case 9.2.28 and 9.2.29	12.10.0	12.11.0
2016-09	RAN#73	R5-165529	1498	-	Add Test requirements for TS 36.521-3 Test case 9.2.30 and 9.2.31	12.10.0	12.11.0
2016-09	RAN#73	R5-165530	1499	-	Add Test requirements for TS 36.521-3 Test case 9.2.32 and 9.2.33	12.10.0	12.11.0
2016-09	RAN#73	R5-165577	1507	-	Update Annex F for TS 36.521-3 Test case 9.1.27, 9.1.28, 9.1.33 and 9.1.34	12.10.0	12.11.0
2016-09	RAN#73	R5-165643	1511	-	Correction to applicability for TDD-UTRAN TDD SON	12.10.0	12.11.0
2016-09	RAN#73	R5-165664	1513	-	Correction to test parameters of 3DL CA event triggered report test cases for 8.16.31, 8.16.32, 8.16.33 and 8.16.34	12.10.0	12.11.0
2016-09	RAN#73	R5-165665	1514	-	Clarification of test parameters for RRM asymmetric bandwidth 2CA test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165666	1515	-	Clarification of test applicability for 2DL CA with intra-band non-contiguous	12.10.0	12.11.0
2016-09	RAN#73	R5-165667	1516	-	Clean up on CA RRM test cases 8.16.25 and 9.1.40_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165668	1517	-	Update of cell configuration mappings for FDD/TDD 3CA band combination	12.10.0	12.11.0
2016-09	RAN#73	R5-165669	1518	-	Correction to the test applicability for test cases 8.20.4, 8.20.4A and 8.20.4B	12.10.0	12.11.0
2016-09	RAN#73	R5-165670	1519	-	Clean up on RRM test cases 8.7.2 and 8.11.4	12.10.0	12.11.0
2016-09	RAN#73	R5-165851	1537	-	Removing redundant Editor's note from Clause 9 in 36.521-3	12.10.0	12.11.0
2016-09	RAN#73	R5-165852	1538	-	Adding antenna connection diagram references to RRM DC RLM test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165853	1539	-	Updating Annex E with DC RLM test cases 7.3.38 – 7.3.43	12.10.0	12.11.0
2016-09	RAN#73	R5-165861	1540	-	Update of definitions for IncMon	12.10.0	12.11.0
2016-09	RAN#73	R5-166024	1500	1	Correction of triggering event for SCE test case 8.22.5 and 8.22.6	12.10.0	12.11.0
2016-09	RAN#73	R5-166025	1501	1	Introduce Cell configuration mapping for SCE RRM test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-166098	1484	1	Update of test tolerance for UE ProSe direct communication SLSS initiation and cease	12.10.0	12.11.0
2016-09	RAN#73	R5-166100	1512	1	Correction to 3DL CA Activation and Deactivation test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165575	1505	-	Update Test requirement for TS 36.521-3 Test case 9.1.27and 9.1.28	12.10.0	12.11.0

2016-09	RAN#73	R5-165576	1506	-	Update Test requirement for TS 36.521-3 Test case 9.1.33 and 9.1.34	12.10.0	12.11.0
2016-09	RAN#73	R5-166305	1536	1	Adding CQI reporting periodicity to MTC test cases	12.10.0	12.11.0
2016-09	RAN3#73	R5-166306	1492	1	Uncertainties and Test Tolerances for intra frequency absolute and relative CSI-RSRP accuracies in CRI-RS based discovery signal Aggregation	12.10.0	12.11.0
2016-09	RAN#73	R5-166308	1527	1	Add note to cell mapping table in Annex E for band 66 high range testing	12.10.0	12.11.0
2016-09	RAN#73	R5-165385	1488	-	Introduction of FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165388	1489	-	Introduction of HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165390	1491	-	Introduction of TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165505	1495	-	Introduction of Band 45 into 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5=165570	1502	-	Update Test requirement for TS 36.521-3 Test case 6.2.7 and 6.2.8	12.11.0	13.0.0
2016-09	RAN#73	R5-165571	1503	-	Update Test requirement for TS 36.521-3 Test case 7.2.4	12.11.0	13.0.0
2016-09	RAN#73	R5-165572	1504	-	Update Annex F for TS 36.521-3 Test case 6.2.7, 6.2.8 and 7.2.4	12.11.0	13.0.0
2016-09	RAN#73	R5-165739	1520	-	Correction to Band 66 notes in E-UTRA band groups in 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165836	1528	-	Adding new eMTC test case 6.1.9 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165839	1529	-	Adding new eMTC test case 6.1.10 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165840	1530	-	Adding new eMTC test case 6.1.11 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165841	1531	-	Adding new eMTC test case 7.1.10 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165842	1532	-	Adding new eMTC test case 7.1.11 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165844	1533	-	Adding new eMTC RRM test cases to Annex E of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165845	1534	-	Adding new eMTC RMCs to Annex A of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-166089	1485	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-166090	1487	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	12.11.0	13.0.0
2016-09	RAN#73	R5-166163	1474	1	Introduction of eMTC RRM TC 4.2.12	12.11.0	13.0.0
2016-09	RAN#73	R5-166164	1475	1	Introduction of eMTC RRM TC 4.2.13	12.11.0	13.0.0
2016-09	RAN#73	R5-166167	1486	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-166182	1543	1	Addition of RLM test cases for FD-FDD CE Mode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166175	1523	1	New Test Case: 7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166176	1524	1	New test case: 7.3.51: E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 Configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166178	1526	1	New test case: 7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166183	1544	1	Addition of RLM test cases for HD-FDD CE Mode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166316	1521	2	New Test Case: 6.2.10: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	12.11.0	13.0.0
2016-09	RAN#73	R5-166317	1522	2	New Test Case: 6.2.11: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	12.11.0	13.0.0
2016-09	RAN#73	R5-166318	1535	1	Adding new OCNG pattern definitions for eMTC to Annex D of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-166333	1525	2	New Test Case: 7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	12.1.00	13.0.0
2016-12	RAN#74	R5-168061	1546	F	New Reference Channel for TS 37.571-1 RSTD tests	13.0.0	13.1.0
2016-12	RAN#74	R5-168131	1547	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168132	1548	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for In-sync for Cat-M1 UE in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168133	1549	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0

2016-12	RAN#74	R5-168134	1550	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for In-Sync in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168156	1551	F	Introduction of new definitions for NB-IoT in Chapter 3	13.0.0	13.1.0
2016-12	RAN#74	R5-168157	1552	F	Introduction of Reference NPRACH Configurations for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168158	1553	F	Introduction of OCNG pattern for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168159	1554	F	Correction of NPDCCH RMC for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168170	1558	F	Uncertainties and Test Tolerances for inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	13.0.0	13.1.0
2016-12	RAN#74	R5-168172	1559	F	Uncertainties and Test Tolerances for FDD/TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	13.0.0	13.1.0
2016-12	RAN#74	R5-168179	1565	F	Uncertainties and Test Tolerances for intra frequency absolute and relative RSRP accuracies of Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168185	1568	F	Introduction of HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-168197	1569	F	Updating Annex F by adding clause 6 test cases for eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168199	1570	F	Updating Annex F by adding clause 7 test cases for eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168200	1571	F	Updating Annex E by adding test cases 6.2.10 and 6.2.11, eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168202	1572	F	Adding Reference PRACH Configuration for eMTC into 36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-168206	1576	F	Updating eMTC RRM test case 7.1.10	13.0.0	13.1.0
2016-12	RAN#74	R5-168208	1577	F	Updating eMTC RRM test case 7.1.11	13.0.0	13.1.0
2016-12	RAN#74	R5-168248	1585	F	Addition of new eMTC RRM test cases to Annex E of 36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-168251	1586	F	Introduction of eMTC RRM new test case 4.2.14	13.0.0	13.1.0
2016-12	RAN#74	R5-168289	1588	F	HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 In-Band mode under enhanced coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168295	1590	F	Adding new eMTC RRM test cases to Annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168296	1591	F	Introduction of new eMTC RRM test case 8.1.29 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-168297	1592	F	Introduction of new eMTC RRM test case 8.1.30 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-168306	1594	F	Updated to DC RRM inter-frequency event triggered reporting test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168475	1600	F	Uncertainties, Test Tolerances and RSRQ absolute accuracy requirements for MTC RRM TC 9.2.42.1, 9.2.43.1 and 9.2.44.1	13.0.0	13.1.0
2016-12	RAN#74	R5-168504	1604	F	NB-IoT TA adjustment enhanced coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168505	1605	F	HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168608	1619	F	Update to CE Mode A RLM test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168620	1620	F	Updates to message contents for eMTC RRM TC 4.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-168621	1621	F	Updates to message contents for eMTC RRM TC 4.2.13	13.0.0	13.1.0
2016-12	RAN#74	R5-168622	1622	F	Test Tolerances for eMTC RRM TC 4.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-168623	1623	F	Test Tolerances for eMTC RRM TC 4.2.13	13.0.0	13.1.0
2016-12	RAN#74	R5-168662	1626	F	Introduction of Intra frequency handover Test case 5.1.13 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168663	1627	F	Introduction of Intra frequency handover Test case 5.1.14 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168664	1628	F	Introduction of Intra frequency handover Test case 5.1.15 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168678	1629	F	Clarification of test parameters for RRM asymmetric bandwidth 2CA test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168679	1630	F	Correction to TDD CA Activation and Deactivation of known SCell in Non-DRX test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168680	1631	F	Correction to figure group for timing adjustment 2CA TCs	13.0.0	13.1.0
2016-12	RAN#74	R5-168681	1632	F	Correction to RRM TDD FDD 2CA Event Triggered Report test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168682	1633	F	Correction to Information Bit Payload for TDD PDSCH RMC	13.0.0	13.1.0
2016-12	RAN#74	R5-168710	1636	F	Adding new test case 7.3.44 DC RLM FDD-TDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168711	1637	F	Adding new test case 7.3.45 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168713	1638	F	Adding new test case 7.3.46 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168716	1639	F	Adding new test case 7.3.47 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168718	1640	F	Adding new DC RLM TDD-FDD test cases into Annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168732	1644	F	Adding new test cases for 4 Rx RRM RLM FDD testing to annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168810	1646	F	Updating DC RLM RRM test cases	13.0.0	13.1.0

2016-12	RAN#74	R5-168814	1648	F	Updating DC RLM RRM test cases Annex F	13.0.0	13.1.0
2016-12	RAN#74	R5-168830	1650	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168836	1652	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	13.0.0	13.1.0
2016-12	RAN#74	R5-168848	1653	F	Updating test cases 9.1.6, 9.1.7, 9.1.12, 9.1.13 To include band group FDD_B	13.0.0	13.1.0
2016-12	RAN#74	R5-168854	1654	F	Updating test cases 9.1.6.2, 9.1.7.2, 9.1.12.2, 9.1.13.2 To include band group FDD_B	13.0.0	13.1.0
2016-12	RAN#74	R5-168880	1656	F	Updating eMTC RRM test case 6.1.9	13.0.0	13.1.0
2016-12	RAN#74	R5-168881	1657	F	Updating eMTC RRM test case 6.1.10	13.0.0	13.1.0
2016-12	RAN#74	R5-168882	1658	F	Updating eMTC RRM test case 6.1.11	13.0.0	13.1.0
2016-12	RAN#74	R5-168938	1659	F	Uncertainties and Test Tolerances for intra frequency absolute and relative RSRP accuracies for UE category 0 Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-168971	1661	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-169517	1634	F	Correction to RRM TDD FDD 2CA measurement accuracy test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-169529	1556	F	Introduction of Cell configuration mapping for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-169552	1610	F	Addition of the new TC 9.1.44 4 DL CA PCell in FDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-169553	1611	F	Addition of the new TC 9.2.45 4 DL CA PCell in FDD FDD-TDD RSRQ for E-UTRAN in Carrier Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-169575	1578	F	New Test Case: 6.2.13: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169576	1579	F	New Test Case: 6.2.14: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169577	1580	F	New Test Case: 6.2.15: E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169578	1581	F	Update Annex F Test Tolerance for E-UTRAN FDD-FDD and HD-FDD Radio Link Monitoring Test in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-169579	1560	F	Introduction of test cases 7.2.6 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169580	1561	F	Introduction of test cases 7.2.7 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169581	1562	F	Introduction of test cases 7.2.8 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169582	1601	F	New test case: 8.1.33 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169583	1602	F	New test case: 8.1.34 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169584	1603	F	New test case: 8.1.35 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169585	1624	F	Introduction of new eMTC RRM TC 4.2.15	13.0.0	13.1.0
2016-12	RAN#74	R5-169586	1635	F	eMTC RRM TC 6.2.10 prach-StartingSubframe and numRepetitionPerPreambleAttempt should match	13.0.0	13.1.0
2016-12	RAN#74	R5-169587	1647	F	Introduction of E-UTRAN HD - FDD Intra-Frequency Case for Cat-M1 UE in Enhanced Coverage Test Case	13.0.0	13.1.0
2016-12	RAN#74	R5-169588	1649	F	Introduction of E-UTRAN TDD - TDD Intra-Frequency Case for Cat-M1 UE in Enhanced Coverage Test Case	13.0.0	13.1.0
2016-12	RAN#74	R5-169594	1660	F	Update to E-UTRAN DC intra-frequency event triggered reporting DC Test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-169595	1609	F	Update of test tolerance for UE Initiation and Cease of SLSS for ProSe direct communication	13.0.0	13.1.0
2016-12	RAN#74	R5-169599	1595	F	Introduction of new eMTC RRM test case 9.1.57 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-169600	1617	F	Addition of a new test case 9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169601	1618	F	Update Annex F for TS 36.521-3 Test case 9.1.57, 9.1.58 and 9.1.59	13.0.0	13.1.0
2016-12	RAN#74	R5-169609	1614	F	Correction of triggering event for SCE test case 8.22.7 and 8.22.8	13.0.0	13.1.0

2016-12	RAN#74	R5-169641	1641	F	Adding Antenna connection configuration guide for 4 Rx RRM testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169679	1642	F	Adding new test case 7.3.1_1 for 4 Rx RRM RLM FDD testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169680	1643	F	Adding new test case 7.3.2_1 for 4 Rx RRM RLM FDD testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169695	1555	F	Correction of NPDSCH RMC for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-169698	1625	F	Addition of in-sync RLM test cases for NB-IOT	13.0.0	13.1.0
2016-12	RAN#74	R5-169711	1587	F	Introduction of eMTC RRM new test case 6.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-169718	1615	F	Correction of triggering event for SCE test case 8.22.11 and 8.22.12	13.0.0	13.1.0
2016-12	RAN#74	R5-169726	1606	F	Uncertainties and Test Tolerances for MTC RRM TCs 8.1.19,8.1.20,8.1.21 and 8.2.22	13.0.0	13.1.0
2016-12	RAN#74	R5-169727	1607	F	Uncertainties and Test Tolerances for MTC RRM TCs 8.2.7 and 8.2.8	13.0.0	13.1.0
2016-12	RAN#74	R5-168404	1599	F	Band 70 information to E-UTRA band group in 36.521-3	13.1.0	14.0.0
2017-01	RAN#74	-	-	-	corrections concerning the implementation of R5-168678, R5-168848, R5-169517	14.0.0	14.0.1
2017-03	RAN#75	R5-170588	1680	-	Update test case for HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 In-Band mode under enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170589	1681	-	Update test case for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170590	1682	-	Update test case for Timing Advance Adjustment Accuracy Test for NB-IoT UE in Enhanced Coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170598	1683	-	Addition of the new TC 8.16.53 4 DL PCell in FDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-170629	1684	-	Resubmission of R5-170023 Introduction of RRM Annex I for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-170713	1696	-	Annex update to RRM spec for LAA	14.0.1	14.1.0
2017-03	RAN#75	R5-170727	1698	-	Introduction of Test case 8.16.63 4DL CA Activation/Deactivation PCell in FDD, unknown SCell	14.0.1	14.1.0
2017-03	RAN#75	R5-170795	1706	-	Uncertainties and Test Tolerances for the Test Cases 9.1.29 and 9.1.30	14.0.1	14.1.0
2017-03	RAN#75	R5-170821	1709	-	Addition of Table H.3.1-2a for E-UTRAN intra frequency measurement configuration for Cat-M1 UE	14.0.1	14.1.0
2017-03	RAN#75	R5-170871	1710	-	(Editorial) Correction of Cell mapping information in 36.521-3 Annex E for RRM TC 9.2.25.1 and 9.2.25.2	14.0.1	14.1.0
2017-03	RAN#75	R5-170878	1712	-	Correction of SRS-Bandwidth for RRM TC 7.1.10	14.0.1	14.1.0
2017-03	RAN#75	R5-170882	1714	-	Correction of eMTC RRM TC 6.2.10 and 6.2.10 prach-StartingSubframe	14.0.1	14.1.0
2017-03	RAN#75	R5-170963	1715	-	Correction of NPDSCH RMC for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-170977	1720	-	Addition of new test case 9.1.60 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with FDD Pcell	14.0.1	14.1.0
2017-03	RAN#75	R5-170978	1721	-	Addition of new test case 9.1.61 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD Pcell	14.0.1	14.1.0
2017-03	RAN#75	R5-170990	1725	-	Addition of Event triggered reporting on LAA deactivated SCell and E-UTRAN FDD PCell interruption in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-170998	1726	-	Correct test procedures to DC RRM TC 8.23.x	14.0.1	14.1.0
2017-03	RAN#75	R5-170999	1727	-	Update Annex A.2 for DC PCFICH/PDCCH/PHICH parameters	14.0.1	14.1.0
2017-03	RAN#75	R5-171000	1728	-	Introduction of new eMTC RRM TC 8.1.31 for category M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171001	1729	-	Introduction of new eMTC RRM TC 8.1.32 for category M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171002	1730	-	Add new eMTC RRM test cases into Annex E	14.0.1	14.1.0
2017-03	RAN#75	R5-171005	1732	-	Correction to NB-IoT and LTE Cell naming used in the tests	14.0.1	14.1.0
2017-03	RAN#75	R5-171008	1733	-	Introduction of 4DL CA RRM TC 8.16.51	14.0.1	14.1.0
2017-03	RAN#75	R5-171032	1739	-	Adding eMTC RRM test cases 6.1.12-14 and 7.1.14-16 to Annex E	14.0.1	14.1.0
2017-03	RAN#75	R5-171051	1743	-	Test Tolerance updating of test cases 9.1.8.1, 9.1.9.1 To include band group FDD_B	14.0.1	14.1.0
2017-03	RAN#75	R5-171052	1744	-	Addition of the new TC 9.1.45 4DL PCell in TDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171053	1745	-	Addition of the new TC 9.1.48 5DL PCell in FDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171054	1746	-	Addition of the new TC 9.1.49 5DL PCell in TDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171056	1747	-	Addition of the new TC 9.2.46 4DL PCell in TDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0

2017-03	RAN#75	R5-171057	1748	-	Addition of the new TC 9.2.47 5DL PCell in FDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171059	1750	-	Addition of the new TC 9.2.48 5DL PCell in TDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171061	1751	-	Minor correction about RSRP/RSRQ for FDD-TDD CA test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171074	1757	-	Update clause 3A.4 Antenna principles	14.0.1	14.1.0
2017-03	RAN#75	R5-171149	1766	-	Test Tolerance: Adding eMTC RRM test case 7.1.12	14.0.1	14.1.0
2017-03	RAN#75	R5-171195	1773	-	Removal of editor's note for TDD FDD 2CA RRM Test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171281	1781	-	Update of Cell configuration mapping for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-171703	1734	1	Updated Annex I.4 RRM requirement exception RRM TC 8.22	14.0.1	14.1.0
2017-03	RAN#75	R5-171704	1775	1	Correction to neighbour cell config for autonomous gaps test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171727	1686	1	Update of HD-FDD UE Transmit Timing Accuracy Tests under enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171728	1688	1	Update of HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171729	1689	1	Intra-frequency cell reselection under normal coverage for NB-IOT	14.0.1	14.1.0
2017-03	RAN#75	R5-171730	1741	1	Adding Test case 7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171731	1742	1	Adding Test case 7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in extended coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171739	1695	1	LAA:Update to common RRM configuration.	14.0.1	14.1.0
2017-03	RAN#75	R5-171740	1716	1	Addition of LAA SCell activation and deactivation of known SCell with E-UTRA FDD PCell in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171741	1749	1	Adding LAA RRM test case 8.26.9	14.0.1	14.1.0
2017-03	RAN#75	R5-171742	1752	1	Adding LAA RRM test case 8.26.10	14.0.1	14.1.0
2017-03	RAN#75	R5-171743	1753	1	Adding LAA RRM test case 9.2.51	14.0.1	14.1.0
2017-03	RAN#75	R5-171744	1754	1	Adding LAA RRM test case 9.2.52	14.0.1	14.1.0
2017-03	RAN#75	R5-171746	1759	1	Test tolerance addition for TS 36.521-3 Test case 8.22.5 and 8.22.6	14.0.1	14.1.0
2017-03	RAN#75	R5-171755	1765	1	LAA: Addition of the new test case and test tolerances for FDD intra frequency absolute and relative RSRP accuracies for SCell with frame structure 3	14.0.1	14.1.0
2017-03	RAN#75	R5-171759	1691	1	Uncertainties and Test Tolerances for TS 36.521-3 Test Cases 4.2.15, 4.2.16, and 4.2.17 and Corresponding Core Specification Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171768	1767	1	Test Tolerance CR, adding eMTC RRM test case 7.1.14	14.0.1	14.1.0
2017-03	RAN#75	R5-171769	1768	1	Test Tolerance CR, adding eMTC RRM test case 7.1.15	14.0.1	14.1.0
2017-03	RAN#75	R5-171770	1769	1	Test Tolerance CR, adding eMTC RRM test case 7.1.16	14.0.1	14.1.0
2017-03	RAN#75	R5-171771	1672	1	Test Tolerances Updates in Test Case: 6.2.14: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171772	1673	1	Test Tolerances Updates in Test Case: 6.2.15: E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171773	1670	1	Test Tolerances and Uncertainties Updates in Annexes E and F for Test Cases 6.2.13-15, 7.3.50-51 and 7.3.54-55	14.0.1	14.1.0
2017-03	RAN#75	R5-171783	1774	1	Correction to test parameters and test tolerance for RRM 2CA asymmetric bandwidth test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171799	1674	1	New Test Case: E-UTRAN FDD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171800	1675	1	New Test Case: E-UTRAN HD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171801	1676	1	New Test Case: E-UTRAN TDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171804	1690	1	Update to CE mode A RLM test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171805	1711	1	New SIB1-BR-r13 and PRACH Config SIB default introduced for RRM TC 6.2.10	14.0.1	14.1.0
2017-03	RAN#75	R5-171806	1731	1	Update Intra-frequency test cases for Cat-M1 UE in normal and enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171808	1771	1	Correction to OCNG pattern for Cat-M1 FD-FDD and HD-FDD re-establishment TCs	14.0.1	14.1.0
2017-03	RAN#75	R5-171810	1779	1	eMTC RRM TC 6.2.10 clarification on test procedure	14.0.1	14.1.0
2017-03	RAN#75	R5-171811	1780	1	Adding eMTC RRM test case 8.1.36	14.0.1	14.1.0
2017-03	RAN#75	R5-171812	1782	1	Adding eMTC RRM test case 8.1.37	14.0.1	14.1.0
2017-03	RAN#75	R5-171854	1701	1	Introduction to RRM test case 8.16.57 4DL FDD CA activation and deactivation of known SCell in non-DRX	14.0.1	14.1.0

2017-03	RAN#75	R5-171855	1702	1	Introduction to RRM test case 8.16.61 4DL FDD CA activation and deactivation of unknown SCell in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171856	1705	1	Introduction to RRM test case 9.1.50 5DL FDD RSRP for E-UTRAN in Carrier Aggregation	14.0.1	14.1.0
2017-03	RAN#75	R5-171857	1777	1	New RRM TC 8.16.55: E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171858	1707	1	Introduction of Rel-13 CA RRM new test case 9.1.46	14.0.1	14.1.0
2017-03	RAN#75	R5-171859	1708	1	Introduction of Rel-13 CA RRM new test case 9.1.47	14.0.1	14.1.0
2017-03	RAN#75	R5-171873	1758	1	Adding new test case 8.3.7 for IncMon RRM testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171874	1761	1	Adding new test case 8.4.7 for IncMon RRM testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171886	1735	1	Update RRM general section 3 for V2X information	14.0.1	14.1.0
2017-03	RAN#75	R5-171891	1755	1	Adding new test case 7.3.3_1 for 4 Rx RRM RLM TDD testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171892	1756	1	Adding new test case 7.3.4_1 for 4 Rx RRM RLM TDD testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171899	1699	1	Introduction of Test case 8.16.59 4DL CA Activation/Deactivation PCell in FDD, known SCell	14.0.1	14.1.0
2017-03	RAN#75	R5-171901	1679	1	Update TS 36.521-3 with Addition of LTE Band 48	14.0.1	14.1.0
2017-03	RAN#75	R5-171926	1738	1	Updates to HD-FDD RLM In-sync tests for category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171927	1717	1	Test tolerance CR, Addition of new test case 8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX under FS3	14.0.1	14.1.0
2017-03	RAN#75	R5-171928	1718	1	Test tolerance CR, Addition of new test case 8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX under FS3	14.0.1	14.1.0
2017-03	RAN#75	R5-171929	1719	1	Test tolerance CR, Update Annex F for test tolerance of test cases 8.26.5 and 8.26.6	14.0.1	14.1.0
2017-03	RAN#75	R5-171933	1671	1	Test Tolerances Updates in Test Case: 6.2.13: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171960	1737	1	Uncertainties and Test Tolerance for DC RRM intra-frequency event triggered reporting test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171964	1722	1	Test tolerance CR, Addition of new test case 7.3.62 Radio Link Monitoring Test for In-sync with DRX under EC for Category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171965	1723	1	Test tolerance CR, Addition of new test case 7.3.63 Radio Link Monitoring Test for In-sync with DRX under NC for Category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171971	1700	2	Correction to intra frequency handover test cases for Cat-M1 UEs in CEModeA	14.0.1	14.1.0
2017-03	RAN#75	R5-171972	1703	2	Uncertainties and Test Tolerances for the test cases 8.1.33, 8.1.34 and 8.1.35 for Cat-M1 UE in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171973	1704	2	Uncertainties and Test Tolerances for the Test Cases 8.1.23, 8.1.24, and 8.1.25 for Cat-M1 UE in CEModeA	14.0.1	14.1.0
2017-03	RAN#75	R5-171974	1736	2	Uncertainties and Test Tolerance for Cat M1 TC8.1.29 and 8.1.30	14.0.1	14.1.0
2017-03	RAN#75	R5-171975	1740	1	Updating eMTC RRM test cases 6.1.9 – 11	14.0.1	14.1.0
2017-03	RAN#75	R5-171976	1762	2	Test Tolerance CR, adding eMTC RRM test case 6.1.12	14.0.1	14.1.0
2017-03	RAN#75	R5-171977	1763	2	Test Tolerance CR, adding eMTC RRM test case 6.1.13	14.0.1	14.1.0
2017-03	RAN#75	R5-171978	1764	2	Test Tolerance CR, adding eMTC RRM test case 6.1.14	14.0.1	14.1.0
2017-03	RAN#75	R5-171979	1772	2	Correction to MPDCCH and PDSCH Reference Channels for Cat-M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171985	1787	1	Correction invalid RI-ConfigIndex in TC 8.16.38	14.0.1	14.1.0
2017-03	RAN#75	R5-171986	1693	2	Uncertainties and Test Tolerances for RRM TC 9.1.18.2_1, 9.1.19.2_1 and 9.1.24.2_1	14.0.1	14.1.0
2017-03	RAN#75	R5-171987	1694	2	Uncertainties and Test Tolerances for RRM TC 9.9.1.1_1 and 9.9.2.1_1	14.0.1	14.1.0
2017-06	RAN#76	R5-172197	1793	-	Update to RRM test cases 8.16.57 and 8.16.61	14.1.0	14.2.0
2017-06	RAN#76	R5-172237	1799	-	Update Test Case 5.1.16: E-UTRAN FDD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB with Test Tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-172238	1800	-	Update Test Case 5.1.17: E-UTRAN HD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB with Test Tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-172239	1801	-	Update Test Case 5.1.18: E-UTRAN TDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.1.0	14.2.0
2017-06	RAN#76	R5-172240	1802	-	Update Test System Uncertainties and Test Tolerances in Annex F for RRM Requirements of Test Cases 5.1.16, 5.1.17 and 5.1.18	14.1.0	14.2.0
2017-06	RAN#76	R5-172256	1806	-	Update of the Message contents about TDD FDD 4/5DL CA RSRP TCs	14.1.0	14.2.0
2017-06	RAN#76	R5-172257	1807	-	Update of the Message contents about TDD FDD 4/5DL CA RSRQ TCs	14.1.0	14.2.0

2017-06	RAN#76	R5-172273	1812	-	Correction of message contents for RRM eMTC TC 4.2.12 and 4.2.15	14.1.0	14.2.0
2017-06	RAN#76	R5-172285	1821	-	Completion of Test cases 8.16.59 and 8.16.63, 4 DL PCell in FDD CA Activation and Deactivation of Known / Unknown SCell in Non-DRX.	14.1.0	14.2.0
2017-06	RAN#76	R5-172329	1825	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.7.1_1+9.1.13.1_1	14.1.0	14.2.0
2017-06	RAN#76	R5-172331	1826	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.7.2_1+9.1.13.2_1	14.1.0	14.2.0
2017-06	RAN#76	R5-172384	1836	-	Updated minimum conformance requirement to TC4.2.15	14.1.0	14.2.0
2017-06	RAN#76	R5-172389	1840	-	Correction to complete eMTC RRM 8.1.x tests	14.1.0	14.2.0
2017-06	RAN#76	R5-172390	1841	-	Updated to eMTC RRM TC 8.1.31 and 8.1.32	14.1.0	14.2.0
2017-06	RAN#76	R5-172391	1842	-	Add RMC for V2V Sidelink Communication	14.1.0	14.2.0
2017-06	RAN#76	R5-172420	1846	-	DC: Addition of Interruption test cases for Dual Connectivity	14.1.0	14.2.0
2017-06	RAN#76	R5-172538	1849	-	Reducing test time for eMTC RRM test cases	14.1.0	14.2.0
2017-06	RAN#76	R5-172545	1855	-	Test Tolerance CR to update Annex F for LAA test cases 8.26.2, 8.26.4, 9.1.60 and 9.1.61	14.1.0	14.2.0
2017-06	RAN#76	R5-172631	1866	-	Correction to RRM 4DL FDD CA Activation and Deactivation test cases	14.1.0	14.2.0
2017-06	RAN#76	R5-172660	1868	-	Editorial correction of TDD-FDD 2CA measurement accuracy test cases	14.1.0	14.2.0
2017-06	RAN#76	R5-172661	1869	-	Correction to test parameters and test tolerance for RRM 2CA asymmetric bandwidth test case 8.16.22	14.1.0	14.2.0
2017-06	RAN#76	R5-172671	1871	-	eMTC RRM: Correction to MPDCCH and PDSCH Reference Measurement Channels	14.1.0	14.2.0
2017-06	RAN#76	R5-172688	1872	-	Test Tolerance: Updates of test cases 8.26.9 and 8.26.10	14.1.0	14.2.0
2017-06	RAN#76	R5-172704	1874	-	Test Tolerance: Updates of test cases 9.2.51 and 9.2.52	14.1.0	14.2.0
2017-06	RAN#76	R5-172733	1876	-	Test requirements addition and other updates for TS 36.521-3 Test case 8.22.11 and 8.22.12	14.1.0	14.2.0
2017-06	RAN#76	R5-172735	1877	-	Update of TS 36.521-3 Test case 8.22.5 and 8.22.6	14.1.0	14.2.0
2017-06	RAN#76	R5-172748	1880	-	Updates of test cases 7.1.10, 7.1.11 and 7.1.12	14.1.0	14.2.0
2017-06	RAN#76	R5-172750	1882	-	Test Tolerance updating of test cases 9.1.8.2, 9.1.9.2 To include band group FDD_B	14.1.0	14.2.0
2017-06	RAN#76	R5-172753	1883	-	Adding RLM test cases for 4Rx UEs	14.1.0	14.2.0
2017-06	RAN#76	R5-172754	1884	-	Updates of test cases in Clause 4 to cater for 4Rx testing.	14.1.0	14.2.0
2017-06	RAN#76	R5-172755	1885	-	Addition of band group table for NB-IoT operating bands	14.1.0	14.2.0
2017-06	RAN#76	R5-172757	1886	-	Addition of two IncMon test cases 8.3.8 and 8.3.9	14.1.0	14.2.0
2017-06	RAN#76	R5-173055	1823	1	Introducing transition period for legacy 2Rx test cases impacted by Rel-13 4Rx WI	14.1.0	14.2.0
2017-06	RAN#76	R5-173056	1791	1	LAA: Test tolerance analysis for RSRP accuracy and addition of TDD-FS3 RSRP accuracy test case	14.1.0	14.2.0
2017-06	RAN#76	R5-173057	1829	1	New RRM LAA TCs 9.11.1 and 9.11.2 including Test Tolerances	14.1.0	14.2.0
2017-06	RAN#76	R5-173061	1857	2	Test tolerance updates for the test cases 7.1.17 and 7.1.18	14.1.0	14.2.0
2017-06	RAN#76	R5-173066	1837	2	Introduction of test cases 7.2.10 in CEModeB with Test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173067	1838	2	Introduction of test cases 7.2.11 in CEModeB with Test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173068	1839	2	Introduction of test cases 7.2.12 in CEModeB with Test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173225	1792	1	Correction on Annex J	14.1.0	14.2.0
2017-06	RAN#76	R5-173226	1817	1	Correct TC title RRM 5DL CA testcases	14.1.0	14.2.0
2017-06	RAN#76	R5-173229	1861	1	Addition of SIB exceptions for RLM for UE category NB1 in Annex H	14.1.0	14.2.0
2017-06	RAN#76	R5-173231	1875	1	Test requirements addition and other updates for TS 36.521-3 Test case 8.22.7 and 8.22.8	14.1.0	14.2.0
2017-06	RAN#76	R5-173233	1833	1	Updated to RRM 4DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX test cases and Test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173234	1834	1	Introduction of 4DL CA RRM TC 8.16.52 with uncertainties and test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173235	1863	1	Introduction of 4DL CA RRM TC 8.16.54 with Test tolerance	14.1.0	14.2.0
2017-06	RAN#76	R5-173237	1789	1	LAA: Test Tolerance analysis and test update of LAA Scell activation and deactivation	14.1.0	14.2.0
2017-06	RAN#76	R5-173238	1852	1	Test Tolerance CR, addition of LAA test cases 8.26.2	14.1.0	14.2.0
2017-06	RAN#76	R5-173239	1819	1	Introduction of Test case 8.26.7 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal, including Test Tolerances	14.1.0	14.2.0
2017-06	RAN#76	R5-173240	1820	1	Introduction of Test case 8.26.8 E-UTRAN TDD-FS3 Intra-frequency event triggered reporting in DRX for CRS based discovery signal, including Test Tolerances	14.1.0	14.2.0

2017-06	RAN#76	R5-173242	1854	1	Test Tolerance CR of LAA test cases 9.1..60 and 9.1.61	14.1.0	14.2.0
2017-06	RAN#76	R5-173244	1853	1	Test Tolerance CR, addition of LAA test cases 8.26.4	14.1.0	14.2.0
2017-06	RAN#76	R5-173245	1790	1	LAA: Test Tolerance analysis and test update of LAA Scell event reporting for deactivated cell	14.1.0	14.2.0
2017-06	RAN#76	R5-173248	1856	1	Test tolerance updates for the test cases 6.1.15 and 6.1.16	14.1.0	14.2.0
2017-06	RAN#76	R5-173252	1858	1	Test tolerance updates for the test cases 7.2.9	14.1.0	14.2.0
2017-06	RAN#76	R5-173254	1859	1	Test tolerance updates for the test cases 7.3.62 and 7.3.63	14.1.0	14.2.0
2017-06	RAN#76	R5-173255	1860	1	Test tolerance updates in Annex F for the test cases 6.1.15, 6.1.16, 7.1.17, 7.1.18, 7.2.9, 7.3.62 and 7.3.63	14.1.0	14.2.0
2017-06	RAN#76	R5-173257	1888	1	Test Tolerances for NB-IoT In-Sync RLM test cases 7.3.64 and 7.3.65	14.1.0	14.2.0
2017-06	RAN#76	R5-173258	1808	1	Addition of SIB and default RRC message content exception for eMTC. Part 1: annex H	14.1.0	14.2.0
2017-06	RAN#76	R5-173260	1794	1	Test Tolerance addition and update of test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	14.1.0	14.2.0
2017-06	RAN#76	R5-173261	1795	1	Test Tolerance addition and update of test case E-UTRAN TDD Radio Link Monitoring Test for In-sync for Cat-M1 UE in CEMode A	14.1.0	14.2.0
2017-06	RAN#76	R5-173262	1796	1	Test Tolerance addition and update of test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	14.1.0	14.2.0
2017-06	RAN#76	R5-173263	1797	1	Test Tolerance addition and update of test case E-UTRAN TDD Radio Link Monitoring Test for In-Sync in DRX for UE Category M1 Configured in CEMode A	14.1.0	14.2.0
2017-06	RAN#76	R5-173264	1798	1	Update Annex E and Annex F Test Tolerance for TC7.3.56,7.3.57,7.3.58,7.3.59	14.1.0	14.2.0
2017-06	RAN#76	R5-173265	1803	1	Update Test Case 6.2.10: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage with Test Tolerance Values and Other Changes	14.1.0	14.2.0
2017-06	RAN#76	R5-173266	1804	1	Update Test Case 6.2.11: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage with Test Tolerance Values and Other Changes	14.1.0	14.2.0
2017-06	RAN#76	R5-173267	1805	1	Update Test Tolerance FFS in Test Cases 6.2.13, 6.2.14, 6.2.15 and Annex F 3.2	14.1.0	14.2.0
2017-06	RAN#76	R5-173272	1827	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.8.1_1+9.1.9.1_1	14.1.0	14.2.0
2017-06	RAN#76	R5-173273	1828	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.10.1_1+9.1.11.1_1	14.1.0	14.2.0
2017-06	RAN#76	R5-173275	1843	1	Updated to NB-IoT RRM TC 4.2.18	14.1.0	14.2.0
2017-06	RAN#76	R5-173283	1818	1	Correct TC title RRM LAA testcases	14.1.0	14.2.0
2017-06	RAN#76	R5-173284	1830	1	New RRM LAA TCs 9.12.1 and 9.12.2	14.1.0	14.2.0
2017-06	RAN#76	R5-173285	1831	1	LAA Annex E cell mapping for RRM TC 9.11.1, 9.11.2, 9.12.1 and 9.12.2	14.1.0	14.2.0
2017-06	RAN#76	R5-173286	1878	1	Updates of LAA test cases 8.26.9 and 8.26.10	14.1.0	14.2.0
2017-06	RAN#76	R5-173287	1879	1	Updates of LAA test cases 9.2.51 and 9.2.52	14.1.0	14.2.0
2017-06	RAN#76	R5-173309	1835	1	Add new Rel-13 CA 4DL RRM test cases into Annex E	14.1.0	14.2.0
2017-06	RAN#76	R5-173310	1844	1	Introduction of new Test Case 8.16.67 “5 DL PCell in FDD CA activation and deactivation of Unknown SCell in non-DRX”	14.1.0	14.2.0
2017-06	RAN#76	R5-173311	1845	1	Introduction of new Test Case 8.16.69 “E-UTRAN FDD 5DL CA activation and deactivation of unknown SCell in non-DRX”	14.1.0	14.2.0
2017-06	RAN#76	R5-173312	1850	1	Introduction to RRM test case 8.16.58 E-UTRAN TDD 4DL CA activation and deactivation of know SCell in non-DRX	14.1.0	14.2.0
2017-06	RAN#76	R5-173313	1851	1	Introduction to RRM test case 8.16.60 E-UTRAN PCell in TDD FDD-TDD 4 DL CA activation and deactivation of known SCell in non-DRX	14.1.0	14.2.0
2017-06	RAN#76	R5-173314	1865	1	Correction to RRM 4DL FDD CA Event Triggered Reporting test cases	14.1.0	14.2.0
2017-06	RAN#76	R5-173319	1809	1	Corrections RRM eMTC 6.2.x TCs	14.1.0	14.2.0
2017-06	RAN#76	R5-173320	1810	1	Correction of message contents for RRM eMTC HO TCs (5.1.13 and 5.1.15)	14.1.0	14.2.0
2017-06	RAN#76	R5-173321	1813	1	Correction of SRS BW and message contents for eMTC 7.1.X and 7.2.6 TCs	14.1.0	14.2.0
2017-06	RAN#76	R5-173322	1814	1	Correction to OCNG pattern for all eMTC RRM TCs	14.1.0	14.2.0
2017-06	RAN#76	R5-173323	1824	1	Correct reference of connection diagram in eMTC MISO RRM tests	14.1.0	14.2.0
2017-06	RAN#76	R5-173325	1867	1	Clarification of Inter-band configuration for TDD Band 34	14.1.0	14.2.0
2017-06	RAN#76	R5-173328	1887	1	New test cases: Addition of TC7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous DC	14.1.0	14.2.0

2017-06	RAN#76	R5-173334	1873	1	E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN	14.1.0	14.2.0
2017-06	RAN#76	R5-173335	1890	1	E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN	14.1.0	14.2.0
2017-06	RAN#76	R5-173398	1848	1	Introduction of 5DL TDD RSRP for E-UTRAN in Carrier Aggregation	14.1.0	14.2.0
2017-06	RAN#76	R5-173407	1816	1	NCell configuration mapping correction for RRM NB-IOT TC 4.2.18	14.1.0	14.2.0
2017-06	RAN#76	R5-173425	1881	1	Updates of test cases 7.3.60 and 7.3.61	14.1.0	14.2.0
2017-09	RAN#77	R5-173557	1892	-	Correction of Timing Advance Adjustment Accuracy Test for Cat-M1 UE	14.2.0	14.3.0
2017-09	RAN#77	R5-173558	1893	-	Correction of Annex H for Chapter 7 eMTC	14.2.0	14.3.0
2017-09	RAN#77	R5-173560	1895	-	Editorial Change to add CA Class B to cell config mapping	14.2.0	14.3.0
2017-09	RAN#77	R5-173561	1896	-	Editorial Change to eMTC event triggered 8.1.24 TC	14.2.0	14.3.0
2017-09	RAN#77	R5-173563	1898	-	Editorial Changes to eMTC UL Timing TCs	14.2.0	14.3.0
2017-09	RAN#77	R5-173564	1899	-	Correction of Cell 2 SNR for 7.3.38 and 7.3.38_1 (Editorial Change)	14.2.0	14.3.0
2017-09	RAN#77	R5-173614	1904	-	Introduction of Test case 8.16.64 4DL Pcell in TDD CA activation and deactivation of unknown SCell in non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-173750	1906	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 8.16.55+8.16.56	14.2.0	14.3.0
2017-09	RAN#77	R5-173754	1908	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.14.1_1+9.1.15.1_1	14.2.0	14.3.0
2017-09	RAN#77	R5-173762	1914	-	Editorial Change of 7.4 Dual Connectivity section to correct heading level	14.2.0	14.3.0
2017-09	RAN#77	R5-173779	1915	-	Editorial correction to 4DL CA activation and deactivation test case 8.16.61	14.2.0	14.3.0
2017-09	RAN#77	R5-173780	1916	-	Correction to cell configuration mapping for 4DL CA RRM testing	14.2.0	14.3.0
2017-09	RAN#77	R5-173781	1917	-	Editorial correction to references to Annex E	14.2.0	14.3.0
2017-09	RAN#77	R5-173790	1920	-	Correction to Initial condition for NB-IoT RRM test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-173791	1921	-	Editorial correction to NB-IoT RLM test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-173799	1924	-	Correction to intra frequency case for Cat M1 UE in normal coverage including test tolerance update	14.2.0	14.3.0
2017-09	RAN#77	R5-173802	1927	-	Editorial correction to UE Cat M1 RSRP Test Cases	14.2.0	14.3.0
2017-09	RAN#77	R5-173807	1928	-	Editorial correction to handover test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-173812	1929	-	Test Tolerances, Updates of test cases 7.3.60 and 7.3.61	14.2.0	14.3.0
2017-09	RAN#77	R5-173826	1930	-	Test Tolerances, Updates of DC test cases 7.3.44 – 47	14.2.0	14.3.0
2017-09	RAN#77	R5-173827	1931	-	Editorial, removal of editor's notes in DC test cases 7.3.41 – 43	14.2.0	14.3.0
2017-09	RAN#77	R5-173828	1932	-	Test Tolerances, Updates of 4Rx RLM test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-173934	1943	-	Addition of NB-IoT test case 6.2.16	14.2.0	14.3.0
2017-09	RAN#77	R5-173935	1944	-	Addition of NB-IoT test case 6.2.17	14.2.0	14.3.0
2017-09	RAN#77	R5-174064	1947	-	Completion of RRM test case 8.16.58 E-UTRAN TDD 4DL CA activation and deactivation of know SCell in non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-174066	1948	-	Completion of RRM test case 8.16.60 E-UTRAN PCell in TDD FDD-TDD 4 DL CA activation and deactivation of known SCell in non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-174131	1959	-	Update to RRM test case 9.1.50	14.2.0	14.3.0
2017-09	RAN#77	R5-174140	1961	-	Introduction of 5DL CA RRM TC 8.16.65	14.2.0	14.3.0
2017-09	RAN#77	R5-174141	1962	-	Introduction of 5DL CA RRM TC 8.16.66	14.2.0	14.3.0
2017-09	RAN#77	R5-174143	1964	-	Introduction of 5DL CA RRM TC 8.16.72	14.2.0	14.3.0
2017-09	RAN#77	R5-174146	1965	-	Corrected Test Applicability to 3DL CA tests required event A6 [TEI11]	14.2.0	14.3.0
2017-09	RAN#77	R5-174147	1966	-	Corrected Test Applicability to 3DL CA tests required event A6 [TEI12]	14.2.0	14.3.0
2017-09	RAN#77	R5-174161	1967	-	Addition of SIB and default RRC message content exception for remaining eMTC tests – Chapter 4	14.2.0	14.3.0
2017-09	RAN#77	R5-174162	1968	-	Addition of SIB and default RRC message content exception for remaining eMTC tests – Chapter 6	14.2.0	14.3.0
2017-09	RAN#77	R5-174165	1971	-	Completion of LAA TCs 8.26.x	14.2.0	14.3.0
2017-09	RAN#77	R5-174166	1972	-	Completion of LAA TC 9.1.60 and 9.1.61	14.2.0	14.3.0
2017-09	RAN#77	R5-174167	1973	-	Editorial Change to TC 9.11.1 and 2	14.2.0	14.3.0
2017-09	RAN#77	R5-174168	1974	-	Editorial Changes to TC 9.1.55 and 56	14.2.0	14.3.0
2017-09	RAN#77	R5-174169	1975	-	Annex E updates for LAA	14.2.0	14.3.0
2017-09	RAN#77	R5-174185	1976	-	Update and inclusion of Test Tolerances for Cat M1 test cases A.6.2.10/11/12	14.2.0	14.3.0
2017-09	RAN#77	R5-174273	1982	-	Updates to 36.521-3 related to intra/inter-frequency SI acquisition for HO (AP#75.22)	14.2.0	14.3.0
2017-09	RAN#77	R5-174321	1985	-	Addition of SIB and default RRC message content exception for remaining eMTC tests – Chapter 8	14.2.0	14.3.0
2017-09	RAN#77	R5-174322	1986	-	Addition of SIB and default RRC message content exception for remaining eMTC tests – Chapter 9	14.2.0	14.3.0

2017-09	RAN#77	R5-174323	1987	-	New RMCs for eMTC DRX test cases - Annex	14.2.0	14.3.0
2017-09	RAN#77	R5-174324	1988	-	New RMCs for eMTC DRX test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-174332	1990	-	Editorial Change to update RMC for V2V Sidelink Communication	14.2.0	14.3.0
2017-09	RAN#77	R5-174368	1997	-	Addition of new DC test cases 8.23.7 – 9	14.2.0	14.3.0
2017-09	RAN#77	R5-175013	1902	1	Introduction of Test case 8.16.56 4DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-175031	1980	1	Test tolerance and test case update for Interruption test cases with Dual Connectivity	14.2.0	14.3.0
2017-09	RAN#77	R5-175033	1963	1	Introduction of 5DL CA RRM TC 8.16.71	14.2.0	14.3.0
2017-09	RAN#77	R5-175037	1939	1	Test tolerance, addition of NB-IoT test case 7.3.67	14.2.0	14.3.0
2017-09	RAN#77	R5-175038	1938	1	Test tolerance, addition of NB-IoT test case 7.3.66	14.2.0	14.3.0
2017-09	RAN#77	R5-175039	1940	1	Test tolerance, addition of cell mapping and test uncertainty in Annex E and F	14.2.0	14.3.0
2017-09	RAN#77	R5-175040	1933	1	Test Tolerances, Updates of test cases 7.1.14, 7.1.15 and 7.1.16	14.2.0	14.3.0
2017-09	RAN#77	R5-175041	1934	1	Update Undefined Parameters and Add Test Tolerance Values for Test Case 7.3.50 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	14.2.0	14.3.0
2017-09	RAN#77	R5-175042	1935	1	Update Undefined Parameters and Add Test Tolerance Values for Test Case 7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A	14.2.0	14.3.0
2017-09	RAN#77	R5-175043	1936	1	Resubmit New Test Case: 7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A with Parameters Updated and Test Tolerances Added	14.2.0	14.3.0
2017-09	RAN#77	R5-175044	1937	1	Update Undefined Parameters and Add Test Tolerance Values for Test Case 7.3.55 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A	14.2.0	14.3.0
2017-09	RAN#77	R5-175045	1907	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.2_1	14.2.0	14.3.0
2017-09	RAN#77	R5-175046	1945	1	Update to the LAA test cases 8.26.3 and 8.26.4	14.2.0	14.3.0
2017-09	RAN#77	R5-175047	1958	1	LAA: Correction to event reporting test cases	14.2.0	14.3.0
2017-09	RAN#77	R5-175053	1994	1	Updates to clause 6 RRM test cases to cater for 4Rx only UEs	14.2.0	14.3.0
2017-09	RAN#77	R5-175054	1993	1	Updates to clause 5 RRM test cases to cater for 4Rx only UEs	14.2.0	14.3.0
2017-09	RAN#77	R5-175061	1910	1	Correction of the message contents of RRM UL CA TCs	14.2.0	14.3.0
2017-09	RAN#77	R5-175062	1983	1	Annex E update for 3-DL CA deactivated SCELL measurement	14.2.0	14.3.0
2017-09	RAN#77	R5-175069	1894	1	Correction of message contents for eMTC HO 5.1.13	14.2.0	14.3.0
2017-09	RAN#77	R5-175070	1925	1	Correction to RLM test cases for Cat M1 in CE mode A	14.2.0	14.3.0
2017-09	RAN#77	R5-175071	1984	1	Addition of SIB and default RRC message content exception for remaining eMTC tests – Chapter 7	14.2.0	14.3.0
2017-09	RAN#77	R5-175097	1905	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.1_1	14.2.0	14.3.0
2017-09	RAN#77	R5-175098	1946	1	Editorial: Addition of Conditions for V2X	14.2.0	14.3.0
2017-09	RAN#77	R5-175109	1991	1	Update RRM general section 3 for V2X information	14.2.0	14.3.0
2017-09	RAN#77	R5-175132	1903	1	Introduction of Test case 8.16.62 4DL TDD CA activation and deactivation of unknown SCell in non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-175133	1960	1	Added new Cell configuration mapping table for 5DL RRM test cases into Annex E	14.2.0	14.3.0
2017-09	RAN#77	R5-175134	1977	1	Introduction of new RRM FDD 5DL CA TC 8.16.75	14.2.0	14.3.0
2017-09	RAN#77	R5-175135	1978	1	Introduction of new RRM FDD 5DL CA TC 8.16.77	14.2.0	14.3.0
2017-09	RAN#77	R5-175141	1995	1	Updates to clause 8 RRM test cases to cater for 4Rx only UEs	14.2.0	14.3.0
2017-09	RAN#77	R5-175149	1911	1	Alignment of Antenna Config for NB-IOT Test Cases and addition of SIB1 In-Band Mode exceptions	14.2.0	14.3.0
2017-09	RAN#77	R5-175150	1912	1	Alignment of Annex E for NB-IOT and correction of Cell IDs	14.2.0	14.3.0
2017-09	RAN#77	R5-175151	1913	1	Completion of RRM NB-IOT TC 6.1.15 and 16	14.2.0	14.3.0
2017-09	RAN#77	R5-175153	1919	1	Correction to cell configuration mapping for NB-IoT	14.2.0	14.3.0
2017-09	RAN#77	R5-175154	1922	1	Correction to HD-FDD UE Timing Advance Adjustment Accuracy test case 7.2.9	14.2.0	14.3.0
2017-09	RAN#77	R5-175155	1941	1	Addition of NB-IoT test case 4.2.19	14.2.0	14.3.0
2017-09	RAN#77	R5-175157	1969	1	Corrections to TC 4.2.18	14.2.0	14.3.0
2017-09	RAN#77	R5-175158	1970	1	Alignment of NOCGN patterns with core spec	14.2.0	14.3.0
2017-09	RAN#77	R5-175162	1979	1	Test Tolerances for TCs 8.1.26, 8.1.27 & 8.1.28	14.2.0	14.3.0
2017-09	RAN#77	R5-175163	1992	1	Updates of TCs 8.1.36 – 37 adding TCs 8.1.38-39 and 8.2.9-10	14.2.0	14.3.0

2017-09	RAN#77	R5-175173	1999	1	Add New TC of 8.16.73 for E-UTRAN FDD 5 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	14.2.0	14.3.0
2017-09	RAN#77	R5-175209	1918	2	Editorial correction to NB-IoT RLM test cases 7.3.60 and 7.3.61	14.2.0	14.3.0
2017-09	RAN#77	R5-175212	1996	2	Updates to clause 9 RRM test cases to cater for 4Rx only UEs	14.2.0	14.3.0
2017-09	RAN#77	R5-175213	1900	1	Update Annex F Test Tolerances for TS 36.521-3 Test cases 9.12.1 and 9.12.2	14.2.0	14.3.0
2017-09	RAN#77	R5-175214	1901	1	Update Test Tolerances for TS 36.521-3 Test cases 9.12.1 and 9.12.2	14.2.0	14.3.0
2017-09	RAN#77	R5-175216	1942	2	Addition of NB-IoT test case 4.2.24	14.2.0	14.3.0
2017-12	RAN#78	R5-176076	2000	-	Introduction of E-UTRAN FDD - FDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	14.3.0	14.4.0
2017-12	RAN#78	R5-176077	2001	-	Introduction of E-UTRAN TDD - TDD cell re-selection intra frequency case for UE configured with highSpeedEnhancedMeasFlag	14.3.0	14.4.0
2017-12	RAN#78	R5-176078	2002	-	Introduction of E-UTRAN TDD-TDD intra-frequency event triggered reporting for UE configured with highSpeedEnhancedMeasFlag in synchronous cells in 8.2.11	14.3.0	14.4.0
2017-12	RAN#78	R5-176091	2003	-	Editorial - Remove Editor Note in 9.12	14.3.0	14.4.0
2017-12	RAN#78	R5-176092	2004	-	Editorial - Correction to 8.22.1	14.3.0	14.4.0
2017-12	RAN#78	R5-176093	2005	-	Editorial - Correction to 7.1.7	14.3.0	14.4.0
2017-12	RAN#78	R5-176094	2006	-	Correction of TC applicability in 36.521-3 for chapter 8 RRM eMTC	14.3.0	14.4.0
2017-12	RAN#78	R5-176095	2007	-	Correction of Connection Diagram for eMTC reselection tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176096	2008	-	Completion of eMTC 6.2.x series	14.3.0	14.4.0
2017-12	RAN#78	R5-176097	2009	-	Correction of TC 8.26.1 test procedure to have only 1 SCC	14.3.0	14.4.0
2017-12	RAN#78	R5-176099	2011	-	Changes to Annex E for NB-IOT	14.3.0	14.4.0
2017-12	RAN#78	R5-176100	2012	-	Correction of Connection Diagram for NB-IOT reselection tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176101	2013	-	Correction of Connection Diagram for NB-IOT UL timing and RLM tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176237	2019	-	Introduction of New TC 8.16.70 5DL TDD CA activation and deactivation of unknown SCell in non-DRX	14.3.0	14.4.0
2017-12	RAN#78	R5-176238	2020	-	Introduction of New TC 8.16.74 5DL TDD CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	14.3.0	14.4.0
2017-12	RAN#78	R5-176239	2021	-	Update to applicability of the RRM test case 8.16.57 and 8.16.61 for 4DL CA	14.3.0	14.4.0
2017-12	RAN#78	R5-176309	2029	-	Added RMC for V2X Sidelink Communication	14.3.0	14.4.0
2017-12	RAN#78	R5-176442	2034	-	Test tolerance, update of 4.2.19 and 4.2.24 to add test tolerances	14.3.0	14.4.0
2017-12	RAN#78	R5-176446	2036	-	Test tolerance, Addition of test case 8.4.6, TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0	14.3.0	14.4.0
2017-12	RAN#78	R5-176489	2039	-	Correction to 4DL FDD-TDD CA RSRQ Test 9.2.45	14.3.0	14.4.0
2017-12	RAN#78	R5-176490	2040	-	Correction to 4CA and 5CA RSRP accuracy tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176512	2044	-	Updates to clause 8 single carrier test cases for 4Rx only UEs	14.3.0	14.4.0

2017-12	RAN#78	R5-176513	2045	-	Updates to clause 9 single carrier test cases for 4Rx only UEs	14.3.0	14.4.0
2017-12	RAN#78	R5-176514	2046	-	Editorial correction to Test Parameters for FS3 Channel Occupancy tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176700	2052	-	Changes to RRM Chapter 7 4Rx tests	14.3.0	14.4.0
2017-12	RAN#78	R5-176771	2054	-	Alignment of NOCGN pattern 1 with TS 36.133	14.3.0	14.4.0
2017-12	RAN#78	R5-176862	2061	-	Alignment of 4DL and 5DL RRM tes case titles	14.3.0	14.4.0
2017-12	RAN#78	R5-177088	2022	1	Update NB-IoT RLM Out-of-sync Test cases	14.3.0	14.4.0
2017-12	RAN#78	R5-177105	2016	2	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.46+9.1.47	14.3.0	14.4.0
2017-12	RAN#78	R5-177115	2048	2	Correction to 7.1.17	14.3.0	14.4.0
2017-12	RAN#78	R5-177116	2049	1	Correction to 7.1.18	14.3.0	14.4.0
2017-12	RAN#78	R5-177308	2014	1	TC applicability an completion of RRM 4DL CA chapter 8 test cases	14.3.0	14.4.0
2017-12	RAN#78	R5-177310	2015	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.44+9.1.45	14.3.0	14.4.0
2017-12	RAN#78	R5-177312	2017	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.2.45+9.2.46	14.3.0	14.4.0
2017-12	RAN#78	R5-177314	2032	1	eLAA: Addition of 3-DL event reporting test case for deactivated Scell	14.3.0	14.4.0
2017-12	RAN#78	R5-177315	2059	1	eLAA: Addition of TDD FS3 event triggered reporting	14.3.0	14.4.0
2017-12	RAN#78	R5-177322	2056	1	Correction to FDD_B requirements in 9.1.10.1 and 9.1.14.1	14.3.0	14.4.0
2017-12	RAN#78	R5-177332	2051	1	Changes to RRM Chapter 4 4Rx tests	14.3.0	14.4.0
2017-12	RAN#78	R5-177350	2062	-	Add New TC of 8.16.68 for 5DL Pcell in TDD CA activation and deactivation of unknown SCell in non-DRX	14.3.0	14.4.0
2017-12	RAN#78	R5-177358	2028	1	Updated to RMC for V2V Sidelink Communication	14.3.0	14.4.0
2017-12	RAN#78	R5-177359	2030	1	Introduction of RRM TC 11.1	14.3.0	14.4.0
2017-12	RAN#78	R5-177360	2031	1	Introduction of RRM TC 11.2	14.3.0	14.4.0
2017-12	RAN#78	R5-177372	2057	1	Addition of new TC for V2X_RRM	14.3.0	14.4.0
2017-12	RAN#78	R5-177382	2010	1	Completion of TC 7.3.49	14.3.0	14.4.0
2017-12	RAN#78	R5-177397	2024	1	Introduction of RRM TC 4.2.20	14.3.0	14.4.0
2017-12	RAN#78	R5-177398	2025	1	Introduction of RRM TC 4.2.21	14.3.0	14.4.0
2017-12	RAN#78	R5-177399	2026	1	Introduction of RRM TC 5.1.19	14.3.0	14.4.0
2017-12	RAN#78	R5-177400	2027	1	Introduction of RRM TC 5.1.20	14.3.0	14.4.0
2017-12	RAN#78	R5-177432	2058	1	eLAA: Addition of FDD FS3 event triggered reporting	14.3.0	14.4.0
2017-12	RAN#78	R5-177448	2055	1	Correction of Antenna Configuration in some RadioLinkMonitoring 4Rx test cases	14.3.0	14.4.0
2017-12	RAN#78	R5-177450	2037	1	Update RRM test cases 9.1.4.1_1 and 9.1.4.2_1 to add test configurations for TDD UL/DL configuration 0	14.3.0	14.4.0
2017-12	RAN#78	R5-177451	2038	1	Update RRM test cases 9.2.4.1_1 and 9.2.4.2_1 to add test configurations for TDD UL/DL configuration 0	14.3.0	14.4.0
2017-12	RAN#78	R5-177456	2023	1	Update NB-IoT RLM In-sync Test cases	14.3.0	14.4.0

2017-12	RAN#78	R5-177457	2060	2	Cat1bis new test case: RSRP Measurement accuracy test case for CAT1bis UE	14.3.0	14.4.0
2017-12	RAN#78	R5-176679	2047	-	Band 71 information to E-UTRA band group in 36.521-3	14.4.0	15.0.0
2018-03	RAN#79	R5-180336	2069	-	Band 72 information to E-UTRA band group in 36.521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-180337	2070	-	Band 68 information to E-UTRA band group in 36.521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-180397	2072	-	Test tolerance, Addition of new test case 7.6.1 to 36.521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-180398	2073	-	Test tolerance, Addition of new test case 7.6.2 to 36.521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-180399	2074	-	Test tolerance, Addition of cell mapping and test tolerance in 36.521-3 Annex E and F for RRM test cases 7.6.1 and 7.6.2	15.0.0	15.1.0
2018-03	RAN#79	R5-180411	2077	-	Test tolerance, Update of Annex F to add TT information for 6.2.16 and 6.2.17.	15.0.0	15.1.0
2018-03	RAN#79	R5-180589	2080	-	Correct RRM LAA test applicability in 36521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-180591	2082	-	[Editorial] Correction of cell SNR for 7.3.3	15.0.0	15.1.0
2018-03	RAN#79	R5-180593	2084	-	[Editorial] Correction of prach-StartingSubframe-r13 for 6.2.10	15.0.0	15.1.0
2018-03	RAN#79	R5-180594	2085	-	Correction of 7.3.48	15.0.0	15.1.0
2018-03	RAN#79	R5-180595	2086	-	Correction of 7.3.49	15.0.0	15.1.0
2018-03	RAN#79	R5-180596	2087	-	Correct test equipment connections for RRM 2CC tests - Chapter 8	15.0.0	15.1.0
2018-03	RAN#79	R5-180597	2088	-	Correct test equipment connections for RRM 2CC tests - Chapter 8 Inter-Frequency	15.0.0	15.1.0
2018-03	RAN#79	R5-180598	2089	-	Correct test equipment connections for RRM 2CC tests - Chapter 9	15.0.0	15.1.0
2018-03	RAN#79	R5-180599	2090	-	Correct test equipment connections for RRM 2CC tests - Chapter 9 RSRQ	15.0.0	15.1.0
2018-03	RAN#79	R5-180602	2093	-	Correct test equipment connections for RRM 3CC tests - Chapter 9	15.0.0	15.1.0
2018-03	RAN#79	R5-180603	2094	-	Correct test equipment connections for RRM 3CC tests - Chapter 9 RSRQ	15.0.0	15.1.0
2018-03	RAN#79	R5-180606	2097	-	Correct test equipment connections for RRM 4CC tests - Chapter 9	15.0.0	15.1.0
2018-03	RAN#79	R5-180607	2098	-	Correct test equipment connections for RRM 4CC tests - Chapter 9 RSRQ	15.0.0	15.1.0
2018-03	RAN#79	R5-180744	2100	-	Updated to Cat-1bis RRM TC 4.2.20 and 4.2.21 and Test Tolerance	15.0.0	15.1.0
2018-03	RAN#79	R5-180745	2101	-	Updated to Cat-1bis RRM TC 5.1.19 and 5.1.20 and Test Tolerance	15.0.0	15.1.0
2018-03	RAN#79	R5-180912	2110	-	Cat1bis: Addition of new CAT1-bis Intra-Frequency Event triggered reporting TC	15.0.0	15.1.0
2018-03	RAN#79	R5-180937	2117	-	Editorial correction to a incorrect reference in 8.16.59	15.0.0	15.1.0
2018-03	RAN#79	R5-180952	2118	-	Correction to clause 7.3 RRM 4Rx test cases	15.0.0	15.1.0
2018-03	RAN#79	R5-180955	2121	-	Correction to channel bandwidth to be tested for LAA RRM test cases	15.0.0	15.1.0
2018-03	RAN#79	R5-180956	2122	-	Correction to successful report rate threshold for LAA channel occupancy tests	15.0.0	15.1.0

2018-03	RAN#79	R5-180957	2123	-	Correction to LAA CSI-RSRP measurement tests	15.0.0	15.1.0
2018-03	RAN#79	R5-180959	2125	-	Correction to LAA RSSI measurement and channel occupancy tests	15.0.0	15.1.0
2018-03	RAN#79	R5-181004	2127	-	Introduction to the new 5DL CA test case 8.16.76	15.0.0	15.1.0
2018-03	RAN#79	R5-181087	2129	-	Update of Incmon RRM test cases 8.3.7, 8.3.8, 8.3.9 and 8.4.7	15.0.0	15.1.0
2018-03	RAN#79	R5-181104	2130	-	Update of NPRACH Test cases 6.2.16 and 6.2.17	15.0.0	15.1.0
2018-03	RAN#79	R5-181344	2124	1	Correction to LAA RSRP/RSRQ measurement tests	15.0.0	15.1.0
2018-03	RAN#79	R5-181358	2075	2	Test tolerance, Update of test case 6.2.16 to add TT information.	15.0.0	15.1.0
2018-03	RAN#79	R5-181359	2076	2	Test tolerance, Update of test case 6.2.17 to add TT information.	15.0.0	15.1.0
2018-03	RAN#79	R5-181363	2126	2	Correction to CatNB1 HD-FDD Transmit Timing Accuracy Tests	15.0.0	15.1.0
2018-03	RAN#79	R5-181514	2078	1	Insertion of test tolerance statements for HST test cases 4.2.22&4.2.23&8.2.11 in Annex F	15.0.0	15.1.0
2018-03	RAN#79	R5-181515	2079	1	Update the HST test cases in line with the test tolerance analysis in 4.2.22,4.2.23 and 8.2.11	15.0.0	15.1.0
2018-03	RAN#79	R5-181528	2083	1	Cell mapping correction for 4DL CA Tests	15.0.0	15.1.0
2018-03	RAN#79	R5-181541	2114	1	eLAA: Addition of 3-DL event reporting test case for deactivated Scell	15.0.0	15.1.0
2018-03	RAN#79	R5-181556	2120	1	Correction to test applicability of LAA RRM test cases	15.0.0	15.1.0
2018-03	RAN#79	R5-181589	2107	1	Cat1bis RRM RSRQ Annex E	15.0.0	15.1.0
2018-03	RAN#79	R5-181590	2108	1	Cat1bis RRM RSRQ Annex F	15.0.0	15.1.0
2018-03	RAN#79	R5-181591	2109	1	Addition of Cat1bis CGI Reading tests	15.0.0	15.1.0
2018-03	RAN#79	R5-181592	2111	1	Cat1bis: Addition of new CAT1-bis RSRQ Measurement accuracy test case	15.0.0	15.1.0
2018-03	RAN#79	R5-181593	2112	1	Cat1bis: Addition of new CAT1-bis Transmit timing accuracy test case	15.0.0	15.1.0
2018-03	RAN#79	R5-181594	2113	1	Cat1bis: Addition of new CAT1-bis Timing advance accuracy test case	15.0.0	15.1.0
2018-03	RAN#79	R5-181595	2116	1	Updates to Cat1bis RSRP Measurement accuracy test cases	15.0.0	15.1.0
2018-03	RAN#79	R5-181598	2115	1	Cat1bis: Addition of new radio link monitoring test cases for CAT1-bis UE	15.0.0	15.1.0
2018-03	RAN#79	R5-181611	2128	1	Addition of the Band 74 information into TS 36.521-3	15.0.0	15.1.0
2018-03	RAN#79	R5-181635	2131	1	Update of V2V RRM Test Cases	15.0.0	15.1.0
2018-03	RAN#79	R5-181655	2091	1	Correct test equipment connections for RRM 3CC tests - Chapter 8 unknown Scell	15.0.0	15.1.0
2018-03	RAN#79	R5-181656	2092	1	Correct test equipment connections for RRM 3CC tests - Chapter 8 known Scell	15.0.0	15.1.0
2018-03	RAN#79	R5-181657	2095	1	Correct test equipment connections for RRM 4CC tests - Chapter 8 unknown Scell	15.0.0	15.1.0
2018-03	RAN#79	R5-181658	2096	1	Correct test equipment connections for RRM 4CC tests - Chapter 8 known Scell	15.0.0	15.1.0
2018-03	RAN#79	R5-181659	2119	1	Correction to LAA RRM tests 8.26.x	15.0.0	15.1.0

2018-06	RAN#80	R5-182193	2132		Completion of RRM TC 9.2.4.1_1 and 9.2.4.2_1	15.1.0	15.2.0
2018-06	RAN#80	R5-182194	2133		TC 9.2.4.1_1 and 9.2.4.2_1 Annex F	15.1.0	15.2.0
2018-06	RAN#80	R5-182196	2135		Editorial correction of RRM TC 8.16.55	15.1.0	15.2.0
2018-06	RAN#80	R5-182198	2137		Completion of RRM TC 8.16.68	15.1.0	15.2.0
2018-06	RAN#80	R5-182200	2139		Applicability for RRM TC 8.16.70	15.1.0	15.2.0
2018-06	RAN#80	R5-182201	2140		Corrections to RRM TC 8.16.71	15.1.0	15.2.0
2018-06	RAN#80	R5-182202	2141		Completion of RRM TC 8.16.73	15.1.0	15.2.0
2018-06	RAN#80	R5-182205	2144		Editorial correction of RRM TC 9.1.46	15.1.0	15.2.0
2018-06	RAN#80	R5-182206	2145		Completion of RRM TC 9.1.48	15.1.0	15.2.0
2018-06	RAN#80	R5-182207	2146		Completion of RRM TC 9.1.49	15.1.0	15.2.0
2018-06	RAN#80	R5-182208	2147		Completion of RRM TC 9.1.50	15.1.0	15.2.0
2018-06	RAN#80	R5-182209	2148		Completion of RRM TC 9.1.51	15.1.0	15.2.0
2018-06	RAN#80	R5-182211	2150		Corrections to Annex F for 5DL CA RRM tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182277	2167		Annex E RRM Cat1bis 6.2.x and 6.3.x tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182278	2168		Annex F RRM Cat1bis 6.2.x and 6.3.x tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182719	2182		Introduction of TC 8.16.78 5DL TDD CA activation and deactivation of know SCell in non-DRX	15.1.0	15.2.0
2018-06	RAN#80	R5-182728	2183		Correction to applicability of LAA section 9 RRM test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-182740	2186		Correction to 5DL CA TDD-FDD RSRQ tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182754	2190		Correction to FS3 event trigger reporting tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182755	2191		Correction to FS3 channel occupancy tests	15.1.0	15.2.0
2018-06	RAN#80	R5-182764	2192		Correction connection diagram used for Cat-1bis test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-182766	2193		Adding MPDCCH information for category M2	15.1.0	15.2.0
2018-06	RAN#80	R5-182767	2194		Adding OCNG patter for V2X Sidelink test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-182787	2195		Addition of Cell configuration Mapping for HST	15.1.0	15.2.0
2018-06	RAN#80	R5-182895	2199		Editorial correction to CAT-M1 RLM test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183032	2204		Updates of Band Group B (Band 74) information about RSRP TCs	15.1.0	15.2.0
2018-06	RAN#80	R5-183262	2164	1	Test tolerance, Addition of eNB-IoT test case 6.2.18	15.1.0	15.2.0
2018-06	RAN#80	R5-183716	2151	1	Update of test case 11.1 and 11.2 to add test tolerance information	15.1.0	15.2.0
2018-06	RAN#80	R5-183719	2156	1	Introduction of RRM TC 5.1.3_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183720	2157	1	Introduction of RRM TC 5.1.4_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183721	2158	1	Introduction of RRM TC 5.1.7_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183722	2159	1	Introduction of RRM TC 5.1.8_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183723	2160	1	Introduction of RRM TC 5.1.5_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183724	2161	1	Introduction of RRM TC 5.1.6_2 with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183725	2163	1	Insertion of test tolerance statements for Cat-1bis RRM test cases in Annex F	15.1.0	15.2.0

2018-06	RAN#80	R5-183726	2176	1	Test Tolerance: Updates to Annex F and other details for Cat1bis Tx Timing and RLM test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183729	2180	1	Correction to NB-IoT Tx Timing Test cases 7.1.17 and 7.1.18	15.1.0	15.2.0
2018-06	RAN#80	R5-183730	2179	1	Add 5MHz eCell Channel BW scenario to NB-IoT Test cases 4.2.18, 6.1.15 and 6.1.16	15.1.0	15.2.0
2018-06	RAN#80	R5-183738	2171	1	Update and correction of message content for 5DL CA RRM test case 8.16.67.	15.1.0	15.2.0
2018-06	RAN#80	R5-183739	2138	1	Completion of RRM TC 8.16.69	15.1.0	15.2.0
2018-06	RAN#80	R5-183740	2142	1	Completion of RRM TC 8.16.75	15.1.0	15.2.0
2018-06	RAN#80	R5-183741	2174	1	Update and correction of erroneous message content for 5DL CA RRM test cases 8.16.77 “5DL FDD CA activation and deactivation of known SCell in non-DRX”.	15.1.0	15.2.0
2018-06	RAN#80	R5-183742	2185	1	Correction to 5DL CA RRM Test Cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183743	2149	1	Corrections to Annex E for 5DL CA RRM tests	15.1.0	15.2.0
2018-06	RAN#80	R5-183756	2187	1	Correction of connection figure for RRM 2Rx 2CC tests without neighbour cells	15.1.0	15.2.0
2018-06	RAN#80	R5-183757	2188	1	Correction of connection figure for RRM 2Rx 3CC/4CC tests without neighbour cells	15.1.0	15.2.0
2018-06	RAN#80	R5-183758	2189	1	Correction to FDD-FS3 Activation and Deactivation test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183771	2177	1	Update to RRM test case 8.16.70 and 8.16.74 for 5DL CA	15.1.0	15.2.0
2018-06	RAN#80	R5-183780	2205		Clarify frame structure in 4Rx test principles section of RRM spec	15.1.0	15.2.0
2018-06	RAN#80	R5-183781	2206		Introduction of RRM TC for E-UTRAN FDD-FDD Inter frequency case for UE Category 1bis with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183782	2207		Introduction of RRM TC for E-UTRAN FDD-TDD Inter frequency case for UE Category 1bis with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183783	2208		Introduction of RRM TC for E-UTRAN TDD-FDD Inter frequency case for UE Category 1bis with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183784	2209		Introduction of RRM TC for E-UTRAN TDD-TDD Inter frequency case for UE Category 1bis with Test Tolerance	15.1.0	15.2.0
2018-06	RAN#80	R5-183799	2197	1	update of V2V RRM TC	15.1.0	15.2.0
2018-06	RAN#80	R5-183807	2162	1	Introduction of Cat 1bis RRM test cases to Annex E	15.1.0	15.2.0
2018-06	RAN#80	R5-183810	2181	1	V2X: Update to timing accuracy test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183811	2196	1	Introduction of V2X RRM TC12.4	15.1.0	15.2.0
2018-06	RAN#80	R5-183827	2165	1	New RRM Cat1bis 6.2.x tests	15.1.0	15.2.0
2018-06	RAN#80	R5-183828	2166	1	New RRM Cat1bis 6.3.x tests	15.1.0	15.2.0
2018-06	RAN#80	R5-183829	2200	1	Updates to Cat1bis Chapter 7 - RLM TC Annex E	15.1.0	15.2.0
2018-06	RAN#80	R5-183830	2201	1	Addition of new CAT1bis Ch8 RRM test cases	15.1.0	15.2.0
2018-06	RAN#80	R5-183865	2178	1	Correction to IncMon RRM Test Cases 8.3.7, 8.3.8, 8.3.9, 8.4.7	15.1.0	15.2.0
2018-06	RAN#80	R5-183866	2203	1	Updates of Band Group B (Band 74) information about RSRQ TCs	15.1.0	15.2.0
2018-06	RAN#80	R5-183883	2170	1	High_Speed_Test: Addition of Intra-frequency event reporting test case	15.1.0	15.2.0

2018-06	RAN#80	R5-183899	2134	1	Corrections to 9.1.10.1 and 2 for band FDD_B	15.1.0	15.2.0
2018-06	RAN#80	R5-183830	2201	1	implementation of missing new test cases of R5-183830	15.2.0	15.2.1
2018-09	RAN#81	R5-184040	2213	-	Deletion of Conditions for GNSS Reliability Requirements for V2X from Annex I.6	15.2.1	15.3.0
2018-09	RAN#81	R5-184102	2216	-	Editorial corrections 8.16.73	15.2.1	15.3.0
2018-09	RAN#81	R5-184105	2219	-	Editorial corrections 7.3.49	15.2.1	15.3.0
2018-09	RAN#81	R5-184106	2220	-	RMC correction 8.1.12_1 (core spec alignment)	15.2.1	15.3.0
2018-09	RAN#81	R5-184107	2221	-	New generic CA RSRP test cases	15.2.1	15.3.0
2018-09	RAN#81	R5-184108	2222	-	New generic CA RSRQ test cases	15.2.1	15.3.0
2018-09	RAN#81	R5-184129	2223	-	Editorial Correction to note 7 in Table E-1	15.2.1	15.3.0
2018-09	RAN#81	R5-184140	2224	-	Removal of technical content in 36.521-3 v14.4.0 and substitution with pointer to the next Release	15.2.1	15.3.0
2018-09	RAN#81	R5-184151	2226	-	Test tolerance update of eHST FDD event reporting test case	15.2.1	15.3.0
2018-09	RAN#81	R5-184203	2233	-	Test Tolerance: Updates to Cat1bis chapter 8 inter-frequency event triggered reporting tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184205	2234	-	Test Tolerance: Updates to Cat1bis Event triggered reporting tests under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	15.2.1	15.3.0
2018-09	RAN#81	R5-184207	2235	-	Test Tolerance: Updates to Cat1bis Event triggered reporting tests with fading, Annex E and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-184209	2236	-	Test Tolerance: Updates to Cat1bis intra-frequency Event triggered reporting tests, Annex E and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-184255	2238	-	Editorial correction to Reference NPRACH Configuration	15.2.1	15.3.0
2018-09	RAN#81	R5-184256	2239	-	Correction to 5CA FDD-TDD Chapter 8 Tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184258	2241	-	Editorial correction to LAA Listen-before-talk model	15.2.1	15.3.0
2018-09	RAN#81	R5-184259	2242	-	Correction to connection figure for 4 DL and 5 DL CA Event Triggered Reporting tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184260	2243	-	Correction to cell configuration mapping table for 8.16.70 and 8.16.78	15.2.1	15.3.0
2018-09	RAN#81	R5-184261	2244	-	Correction to cell configuration mapping for 8.26.3	15.2.1	15.3.0
2018-09	RAN#81	R5-184262	2245	-	Correction to test procedure for FS3 event triggered reporting tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184263	2246	-	Correction to test requirement of FS3 event triggered reporting tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184264	2247	-	Correction to minimum conformance requirements for FDD_B1 and FDD_B2	15.2.1	15.3.0
2018-09	RAN#81	R5-184265	2248	-	Editorial correction to Noc for Cell2 on FDD_B1 or FDD_B2	15.2.1	15.3.0
2018-09	RAN#81	R5-184273	2249	-	Addition of V2X new TC 12.2.1	15.2.1	15.3.0
2018-09	RAN#81	R5-184276	2252	-	Update of Annex F for TC 12.2.1, 12.2.2 and 12.4	15.2.1	15.3.0
2018-09	RAN#81	R5-184289	2254	-	Addition of Rel-13 B5C new TC 8.16.47	15.2.1	15.3.0
2018-09	RAN#81	R5-184290	2255	-	Addition of Rel-13 B5C new TC 8.16.48	15.2.1	15.3.0
2018-09	RAN#81	R5-184291	2256	-	Addition of Rel-13 B5C new TC 8.16.49	15.2.1	15.3.0

2018-09	RAN#81	R5-184292	2257	-	Addition of Rel-13 B5C new TC 8.16.50	15.2.1	15.3.0
2018-09	RAN#81	R5-184293	2258	-	Update of Annex E and Annex F to add cell mapping and TT for 8.16.47-50	15.2.1	15.3.0
2018-09	RAN#81	R5-184375	2259	-	Introduction of TC 6.1.1_2 E-UTRAN FDD Intra-frequency RRC Re-establishment for UE Category 1bis	15.2.1	15.3.0
2018-09	RAN#81	R5-184376	2260	-	Introduction of TC 6.1.2_2 E-UTRAN FDD Inter-frequency RRC Re-establishment for UE Category 1bis	15.2.1	15.3.0
2018-09	RAN#81	R5-184377	2261	-	Introduction of TC 6.1.3_2 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE Category 1bis	15.2.1	15.3.0
2018-09	RAN#81	R5-184378	2262	-	Introduction of TC 6.1.4_2 E-UTRAN TDD Inter-frequency RRC Re-establishment for UE Category 1bis	15.2.1	15.3.0
2018-09	RAN#81	R5-184379	2263	-	Annex E,F RRM Cat1bis 6.1.x tests	15.2.1	15.3.0
2018-09	RAN#81	R5-184421	2264	-	Update to RRM test case 8.16.70 and 8.16.74 for 5DL CA	15.2.1	15.3.0
2018-09	RAN#81	R5-184570	2265	-	Corrections for 5MHz Channel BW in 4.2.19, 6.x.y and 7.3.x NB-IoT Test cases	15.2.1	15.3.0
2018-09	RAN#81	R5-184667	2268	-	Correction to LAA inter-frequency event-triggered reporting test cases	15.2.1	15.3.0
2018-09	RAN#81	R5-184917	2284	-	Correction on 4Rx RLM TC in-sync parameters	15.2.1	15.3.0
2018-09	RAN#81	R5-185184	2250	1	Addition of V2X new TC 12.2.2	15.2.1	15.3.0
2018-09	RAN#81	R5-185337	2237	1	Test Tolerance: Updates to Cat1bis intra-frequency CGI Event triggered reporting tests, Annex E and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-185342	2253	1	Editorial cleaning up of Rel-14 CA 5DL RSRP measurement TC 9.1.51	15.2.1	15.3.0
2018-09	RAN#81	R5-185373	2279	1	Update of V2X RRM	15.2.1	15.3.0
2018-09	RAN#81	R5-185386	2232	1	Completion of Chapter 7 RRM cat 1bis test cases	15.2.1	15.3.0
2018-09	RAN#81	R5-185391	2227	1	Test Tolerance: Updates to Cat1bis inter frequency RSRP accuracy tests and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-185392	2228	1	Test Tolerance: Updates to Cat1bis inter frequency RSRQ accuracy tests and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-185393	2229	1	Test Tolerance: Updates to Cat1bis intra frequency RSRP accuracy tests and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-185394	2230	1	Test Tolerance: Updates to Cat1bis intra frequency RSRQ accuracy tests and Annex F	15.2.1	15.3.0
2018-09	RAN#81	R5-185457	2266	1	Addition of RRM IncMon new Test Case 8.4.8	15.2.1	15.3.0
2018-09	RAN#81	R5-185458	2267	1	Addition of RRM IncMon new Test Case 8.4.9	15.2.1	15.3.0
2018-09	RAN#81	R5-185459	2269	1	Addition of RRM IncMon new Test Case 8.5.8	15.2.1	15.3.0
2018-09	RAN#81	R5-185460	2270	1	Addition of RRM IncMon new Test Case 8.6.3	15.2.1	15.3.0
2018-09	RAN#81	R5-185461	2271	1	Addition of RRM IncMon new Test Case 8.7.5	15.2.1	15.3.0
2018-09	RAN#81	R5-185462	2272	1	Addition of RRM IncMon new Test Case 8.7A.1	15.2.1	15.3.0
2018-09	RAN#81	R5-185463	2273	1	Addition of RRM IncMon new Test Cases 4.2.1 and 4.2.11	15.2.1	15.3.0
2018-09	RAN#81	R5-185464	2274	1	Addition of RRM IncMon new Test Case 4.3.1.5	15.2.1	15.3.0
2018-09	RAN#81	R5-185465	2275	1	Addition of RRM IncMon new Test Case 4.3.2A	15.2.1	15.3.0
2018-09	RAN#81	R5-185466	2276	1	Addition of RRM IncMon new Test Case 4.3.3A	15.2.1	15.3.0
2018-09	RAN#81	R5-185467	2277	1	Addition of RRM IncMon new Test Case 4.3.4.4	15.2.1	15.3.0

2018-09	RAN#81	R5-185483	2217	1	Editorial corrections 9.1.46	15.2.1	15.3.0
2018-09	RAN#81	R5-185484	2218	1	Editorial corrections 9.1.50	15.2.1	15.3.0
2018-09	RAN#81	R5-185485	2231	1	Update of RRM IncMon test cases 8.3.7, 8.3.8, 8.3.9, 8.4.7 including test tolerances	15.2.1	15.3.0
2018-09	RAN#81	R5-185536	2212	1	Correction of GNSS information for V2X tests	15.2.1	15.3.0
2018-09	RAN#81	R5-185544	2280	1	New TC 8.16.83: 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with generic duplex modes	15.2.1	15.3.0
2018-09	RAN#81	R5-185545	2281	1	New TC 8.16.84: 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX with generic duplex modes	15.2.1	15.3.0
2018-09	RAN#81	R5-185546	2282	1	New TC 8.16.85: 3 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	15.2.1	15.3.0
2018-09	RAN#81	R5-185547	2283	1	New TC 8.16.86: 3 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	15.2.1	15.3.0
2018-09	RAN#81	R5-185554	2225	1	Test tolerance update of V2X uplink timing test cases	15.2.1	15.3.0
2018-12	RAN#82	R5-186478	2293	-	Alignment NPRACH configuration (Editorial)	15.3.0	15.4.0
2018-12	RAN#82	R5-186479	2294	-	Correction for 4.2.19	15.3.0	15.4.0
2018-12	RAN#82	R5-186480	2295	-	Correction for 4.2.24 Cell ID selection procedure	15.3.0	15.4.0
2018-12	RAN#82	R5-186481	2296	-	Core spec alignment 4.2.24	15.3.0	15.4.0
2018-12	RAN#82	R5-186483	2298	-	Correction for 7.3.50 and 7.3.51	15.3.0	15.4.0
2018-12	RAN#82	R5-186484	2299	-	Correction for 8.1.28	15.3.0	15.4.0
2018-12	RAN#82	R5-186485	2300	-	Removal of reference to H.7.1-2 for RRM 7.3.5x series	15.3.0	15.4.0
2018-12	RAN#82	R5-186486	2301	-	Add band group FDD B1 and B2 to RSRQ tests - Rel8	15.3.0	15.4.0
2018-12	RAN#82	R5-187043	2322	-	Editorial correction to LAA Event Trigger Reporting Test 8.26.7	15.3.0	15.4.0
2018-12	RAN#82	R5-187044	2323	-	Editorial correction to the E-UTRA operating band group for Cat-M1 Clause 9 Tests	15.3.0	15.4.0
2018-12	RAN#82	R5-187045	2324	-	Editorial correction to 9.1.10.1	15.3.0	15.4.0
2018-12	RAN#82	R5-187046	2325	-	Correction to Cat-M1 intra-frequency event triggered reporting tests	15.3.0	15.4.0
2018-12	RAN#82	R5-187061	2328	-	Correction to 6.1.9 FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	15.3.0	15.4.0
2018-12	RAN#82	R5-187067	2331	-	Correction to FS3 CSI-RSRP accuracy tests	15.3.0	15.4.0
2018-12	RAN#82	R5-187334	2341	-	Changing the cell configuration mapping tables to cater for RRM generic duplex mode tests	15.3.0	15.4.0
2018-12	RAN#82	R5-187393	2342	-	Addition of Cat. M2 Support to RRM CE tests - Chapter 8	15.3.0	15.4.0
2018-12	RAN#82	R5-187394	2343	-	Addition of Cat. M2 Support to RRM CE tests - Chapter 9	15.3.0	15.4.0
2018-12	RAN#82	R5-187444	2344	-	Introduction of RRM TC 4.2.25	15.3.0	15.4.0
2018-12	RAN#82	R5-187445	2345	-	Introduction of RRM TC 4.2.26	15.3.0	15.4.0
2018-12	RAN#82	R5-187446	2346	-	Introduction of RRM TC 4.2.27	15.3.0	15.4.0
2018-12	RAN#82	R5-187470	2347	-	Correction of TC 8.16.83, 8.16.84, 8.16.85 and 8.16.86	15.3.0	15.4.0
2018-12	RAN#82	R5-187472	2348	-	RRM Generic 3DL CA tests – Annex F	15.3.0	15.4.0

2018-12	RAN#82	R5-187850	2290	1	Completion of TC 9.1.69 and 9.1.70	15.3.0	15.4.0
2018-12	RAN#82	R5-187851	2291	1	Completion of TC 9.2.56 and 9.2.57	15.3.0	15.4.0
2018-12	RAN#82	R5-187853	2349	1	Addition of Test Case selection criteria for RRM CA	15.3.0	15.4.0
2018-12	RAN#82	R5-187854	2350	1	Update on Applicability and Procedure for generic duplex mode RRM test case 8.16.86	15.3.0	15.4.0
2018-12	RAN#82	R5-187855	2292	1	Chapter 9 RRM Generic CA tests - Annexes	15.3.0	15.4.0
2018-12	RAN#82	R5-187856	2327	1	Correction to 3DL CA clause 8 generic duplex mode tests	15.3.0	15.4.0
2018-12	RAN#82	R5-187857	2336	1	Introduction of 4 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	15.3.0	15.4.0
2018-12	RAN#82	R5-187858	2337	1	Introduction of 4 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	15.3.0	15.4.0
2018-12	RAN#82	R5-187859	2338	1	Introduction of 5 DL CA Activation and Deactivation of Known SCell in Non-DRX with generic duplex modes	15.3.0	15.4.0
2018-12	RAN#82	R5-187860	2339	1	Introduction of 5 DL CA Activation and Deactivation of Unknown SCell in Non-DRX with generic duplex modes	15.3.0	15.4.0
2018-12	RAN#82	R5-187863	2332	1	Updated RRM clause 4 tests to cover Cat-M2 requirement	15.3.0	15.4.0
2018-12	RAN#82	R5-187869	2302	1	Add band group FDD B1 and B2 to RSRQ tests - Rel11	15.3.0	15.4.0
2018-12	RAN#82	R5-187870	2303	1	Add band group FDD B1 and B2 to RSRQ tests - Rel12	15.3.0	15.4.0
2018-12	RAN#82	R5-187926	2304	1	Correction of RRM IncMon TC 4.2.10	15.3.0	15.4.0
2018-12	RAN#82	R5-187927	2305	1	Correction of RRM IncMon TC 4.2.11	15.3.0	15.4.0
2018-12	RAN#82	R5-187928	2306	1	Correction of RRM IncMon TC 4.3.1.5	15.3.0	15.4.0
2018-12	RAN#82	R5-187929	2307	1	Correction of RRM IncMon TC 4.3.2A	15.3.0	15.4.0
2018-12	RAN#82	R5-187930	2308	1	Correction of RRM IncMon TC 4.3.3A	15.3.0	15.4.0
2018-12	RAN#82	R5-187931	2309	1	Correction of RRM IncMon TC 4.3.4.4	15.3.0	15.4.0
2018-12	RAN#82	R5-187932	2310	1	Correction of RRM IncMon TC 8.4.8	15.3.0	15.4.0
2018-12	RAN#82	R5-187933	2311	1	Correction of RRM IncMon TC 8.4.9	15.3.0	15.4.0
2018-12	RAN#82	R5-187934	2312	1	Correction of RRM IncMon TC 8.5.8	15.3.0	15.4.0
2018-12	RAN#82	R5-187935	2313	1	Correction of RRM IncMon TC 8.6.3	15.3.0	15.4.0
2018-12	RAN#82	R5-187936	2314	1	Correction of RRM IncMon TC 8.7.5	15.3.0	15.4.0
2018-12	RAN#82	R5-187937	2315	1	Correction of RRM IncMon TC 8.7A.1	15.3.0	15.4.0
2018-12	RAN#82	R5-187938	2316	1	Cell Configuration for IncMon RRM Test Cases	15.3.0	15.4.0
2018-12	RAN#82	R5-187939	2317	1	New rows in Annex F tables for IncMon RRM Test Cases	15.3.0	15.4.0
2018-12	RAN#82	R5-187964	2318	1	Update Rel-14 NB-IOT RRM test cases to support category NB2	15.3.0	15.4.0
2018-12	RAN#82	R5-187982	2320	1	Addition of B72 for test cases with 5MHz channel bandwidth	15.3.0	15.4.0
2018-12	RAN#82	R5-187985	2333	1	Updated RRM clause 5 tests to cover Cat-M2 requirement	15.3.0	15.4.0
2018-12	RAN#82	R5-187986	2334	1	Updated RRM clause 6 tests to cover Cat-M2 requirement	15.3.0	15.4.0
2018-12	RAN#82	R5-187987	2335	1	Updated RRM clause 7 tests to cover Cat-M2 requirement	15.3.0	15.4.0
2018-12	RAN#82	R5-187993	2321	1	Update NB-IOT Random Access test cases 6.2.16, 6.2.17 and 6.2.18	15.3.0	15.4.0

2018-12	RAN#82	R5-187994	2319	1	Update 8.16.78 to add TT information	15.3.0	15.4.0
2018-12	RAN#82	R5-188052	2351	-	Editorial correction to FS3 RRM clause 8 Tests	15.3.0	15.4.0
2018-12	RAN#82	R5-188237	2329	1	Correction to 8.26.7 FS3 Intra-frequency event triggered reporting	15.3.0	15.4.0
2019-03	RAN#83	R5-191152	2352	-	Introduction of RRM TC 9.1.68	15.4.0	15.5.0
2019-03	RAN#83	R5-191161	2355	-	Introduction of Rel-13 CA RRM TC 8.16.87 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-191162	2356	-	Introduction of Rel-13 CA RRM TC 8.16.88 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-191163	2357	-	Introduction of Rel-13 CA RRM TC 8.16.91 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-191164	2358	-	Introduction of Rel-13 CA RRM TC 8.16.92 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-191165	2359	-	Updated to Annex E and F for chapter 8 RRM Generic CA tests	15.4.0	15.5.0
2019-03	RAN#83	R5-191502	2366	-	Correction to test procedure for 8.16.39	15.4.0	15.5.0
2019-03	RAN#83	R5-191574	2381	-	Addition of new RRM feMTC Test Case 4.2.28	15.4.0	15.5.0
2019-03	RAN#83	R5-191575	2382	-	Addition of new RRM feMTC Test Case 4.2.29	15.4.0	15.5.0
2019-03	RAN#83	R5-191580	2384	-	Correction of RRM IncMon TC 4.2.10 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191581	2385	-	Correction of RRM IncMon TC 4.2.11 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191582	2386	-	Correction of RRM IncMon TC 4.3.1.5 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191583	2387	-	Correction of RRM IncMon TC 4.3.2A including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191584	2388	-	Correction of RRM IncMon TC 4.3.3A including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191585	2389	-	Correction of RRM IncMon TC 4.3.4.4 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191586	2390	-	Correction of RRM IncMon TC 8.4.8 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191587	2391	-	Correction of RRM IncMon TC 8.4.9 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191588	2392	-	Correction of RRM IncMon TC 8.5.8 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191589	2393	-	Correction of RRM IncMon TC 8.6.3 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191590	2394	-	Correction of RRM IncMon TC 8.7.5 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191591	2395	-	Correction of RRM IncMon TC 8.7A.1 including Test Tolerances	15.4.0	15.5.0
2019-03	RAN#83	R5-191592	2396	-	Correction of MU and TT in Annex F for IncMon RRM Test Cases	15.4.0	15.5.0
2019-03	RAN#83	R5-191788	2400	-	Correction to 8.26.5 and 8.26.7 E-UTRAN FDD-FS3 Intra-frequency event triggered reporting	15.4.0	15.5.0
2019-03	RAN#83	R5-191789	2401	-	Clean up of Cat-M1 event triggered reporting TC 8.1.26 and 8.1.27	15.4.0	15.5.0
2019-03	RAN#83	R5-191790	2402	-	Additional Message Exception for DRX Configuration for CatNB	15.4.0	15.5.0

2019-03	RAN#83	R5-191964	2405	-	Update to NB-IOT uplink timing test case.	15.4.0	15.5.0
2019-03	RAN#83	R5-191966	2407	-	Update on Applicability of NB-IOT RACH test case with Non-anchor Carrier	15.4.0	15.5.0
2019-03	RAN#83	R5-192191	2412	-	Update on Applicability and Procedure for generic duplex mode RRM test case 8.16.85	15.4.0	15.5.0
2019-03	RAN#83	R5-192192	2413	-	Update on Applicability for generic duplex mode RRM test cases 8.16.83, 8.16.84	15.4.0	15.5.0
2019-03	RAN#83	R5-192501	2353	1	Introduction of RRM TC 9.2.55	15.4.0	15.5.0
2019-03	RAN#83	R5-192502	2354	1	Addition of TT Statement and Cell Mapping for TCs 9.1.68 & 9.2.55	15.4.0	15.5.0
2019-03	RAN#83	R5-192525	2360	1	Introduction of RRM TC 7.1.21 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-192526	2361	1	Introduction of RRM TC 7.1.22 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-192527	2362	1	Introduction of RRM TC 7.1.23 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-192528	2363	1	Introduction of RRM TC 7.1.24 with TT	15.4.0	15.5.0
2019-03	RAN#83	R5-192529	2364	1	Updated to Annex E and F for new feMTC RRM chap 7 tests	15.4.0	15.5.0
2019-03	RAN#83	R5-192530	2383	1	Addition of new RRM feMTC Test Case 4.2.30	15.4.0	15.5.0
2019-03	RAN#83	R5-192537	2409	1	Modifications to “E-UTRAN FDD-WLAN Event Triggered Reporting in non-DRX under AWGN” Test Case	15.4.0	15.5.0
2019-03	RAN#83	R5-192538	2410	1	Modifications to “E-UTRAN TDD-WLAN Event Triggered Reporting in non-DRX under AWGN” Test Case	15.4.0	15.5.0
2019-03	RAN#83	R5-192627	2406	1	Update to NB-IOT RLM cases	15.4.0	15.5.0
2019-03	RAN#83	R5-192628	2403	1	Update to 4 DL CA Activation and Deactivation with generic duplex modes	15.4.0	15.5.0
2019-03	RAN#83	R5-192629	2404	1	Update to 5 DL CA Activation and Deactivation with generic duplex modes	15.4.0	15.5.0
2019-03	RAN#83	R5-192630	2408	1	Update to generic duplex mode 3 DL CA deactivation test case	15.4.0	15.5.0
2019-03	RAN#83	R5-192641	2367	1	Band 53 introduction in TS 36.521-3	15.5.0	16.0.0
2019-06	RAN#84	R5-193684	2414	-	Introduction of LTE Band 85 in Group of band definitions	16.0.0	16.1.0
2019-06	RAN#84	R5-193881	2415	-	Update of Annex F.3.2	16.0.0	16.1.0
2019-06	RAN#84	R5-194184	2416	-	Introduction of 3DL/3UL TDD CA Non-Contention Based Random Access Test for 2 SCells	16.0.0	16.1.0
2019-06	RAN#84	R5-194186	2417	-	Introduction of 3DL/3UL TDD CA UE Transmit Timing Accuracy Tests for 2 SCells	16.0.0	16.1.0
2019-06	RAN#84	R5-194219	2418	-	Correction to UE Timing Advance Adjustment Accuracy Tests for CEModeA	16.0.0	16.1.0
2019-06	RAN#84	R5-194220	2419	-	Correction to Cat-M1 Radio Link Monitoring TC 7.3.52 and 7.3.53	16.0.0	16.1.0
2019-06	RAN#84	R5-194221	2420	-	Clean up 3DL and 4DL RSRP test with generic duplex modes	16.0.0	16.1.0
2019-06	RAN#84	R5-194222	2421	-	Clean up 3DL to 5DL CA Activation and Deactivation TCs	16.0.0	16.1.0
2019-06	RAN#84	R5-194223	2422	-	Clean up 3DL to 5DL CA RSRP and RSRQ tests	16.0.0	16.1.0
2019-06	RAN#84	R5-194224	2423	-	Editorial correction to Event Triggered Reporting on Deactivated SCell	16.0.0	16.1.0

2019-06	RAN#84	R5-194225	2424	-	Clean up 3DL to 5DL CA Event Triggered Reporting TCs	16.0.0	16.1.0
2019-06	RAN#84	R5-194334	2425	-	Introduction of 6DL CA RRM TC 8.16.95	16.0.0	16.1.0
2019-06	RAN#84	R5-194335	2426	-	Introduction of 7DL CA RRM TC 8.16.99	16.0.0	16.1.0
2019-06	RAN#84	R5-194336	2427	-	Insertion of test tolerance statements for new RRM test cases in Annex F	16.0.0	16.1.0
2019-06	RAN#84	R5-194337	2428	-	Correction of message content to RRM 5DL CA test cases	16.0.0	16.1.0
2019-06	RAN#84	R5-194414	2430	-	Correction random access tests for eMTC and NB-IoT	16.0.0	16.1.0
2019-06	RAN#84	R5-194415	2431	-	Spec alignment eMTC RMCs for 8.1.x	16.0.0	16.1.0
2019-06	RAN#84	R5-194416	2432	-	Correction 7.1.11 Test 1	16.0.0	16.1.0
2019-06	RAN#84	R5-194417	2433	-	systemInformationBlockType1Dedicated-r11 missing in eMTC HO tests	16.0.0	16.1.0
2019-06	RAN#84	R5-195078	2434	1	Correction to test case 8.16.76 of 36.521-3	16.0.0	16.1.0
2019-06	RAN#84	R5-195085	2429	1	Completion 3DL CA generic tests	16.0.0	16.1.0
2019-09	RAN#85	R5-195728	2438	-	Update of 6.2.16 and 6.2.17 for alignment with core specification	16.1.0	16.2.0
2019-09	RAN#85	R5-196452	2441	-	Update to 3DL/3UL TDD CA for Non-Contention Based Random Access Test for 2 SCells	16.1.0	16.2.0
2019-09	RAN#85	R5-196453	2442	-	Update to 3DL/3UL TDD CA for UE Transmit Timing Accuracy Tests for 2 SCells	16.1.0	16.2.0
2019-09	RAN#85	R5-196634	2444	-	Band 73 information to E-UTRA band group in 36.521-3	16.1.0	16.2.0
2019-09	RAN#85	R5-196686	2446	-	Correction of RRM feMTC Test Case 4.2.28	16.1.0	16.2.0
2019-09	RAN#85	R5-196687	2447	-	Correction of RRM feMTC Test Case 4.2.29	16.1.0	16.2.0
2019-09	RAN#85	R5-196688	2448	-	Correction of RRM feMTC Test Case 4.2.30	16.1.0	16.2.0
2019-09	RAN#85	R5-196689	2449	-	Test system uncertainties and the Test Tolerances for RRM feMTC Test Cases	16.1.0	16.2.0
2019-09	RAN#85	R5-196691	2450	-	Addition of RRM feMTC Test Case 8.1.41	16.1.0	16.2.0
2019-09	RAN#85	R5-196692	2451	-	Addition of RRM feMTC Test Case 8.1.42	16.1.0	16.2.0
2019-09	RAN#85	R5-196693	2452	-	Addition of RRM feMTC Test Case 8.2.14	16.1.0	16.2.0
2019-09	RAN#85	R5-197475	2439	1	Correction 4CC and 5CC applicability - Chapter 8	16.1.0	16.2.0
2019-09	RAN#85	R5-197476	2440	1	Correction 4CC and 5CC applicability - Chapter 9	16.1.0	16.2.0
2019-09	RAN#85	R5-197660	2443	2	Corrections to test case for HD FDD Inter frequency case for UE Category NB1 In-Band mode in enhanced coverage	16.1.0	16.2.0
2019-12	RAN#86	R5-197766	2457	-	Cleaning up of R13 CA RRM test cases	16.2.0	16.3.0
2019-12	RAN#86	R5-198021	2458	-	Correction 6.1.15	16.2.0	16.3.0
2019-12	RAN#86	R5-198022	2459	-	Correction feMTC applicability ch 4	16.2.0	16.3.0
2019-12	RAN#86	R5-198077	2460	-	Update for removing editor's note of V2V Test Cases	16.2.0	16.3.0
2019-12	RAN#86	R5-198107	2461	-	Update to 3DL/3UL TDD CA for UE Transmit Timing Accuracy and Non-Contention Based Random Access Tests for 2 SCells	16.2.0	16.3.0
2019-12	RAN#86	R5-198516	2462	-	Correction of PRACH-Configuration parameters for TC 5.1.13	16.2.0	16.3.0
2019-12	RAN#86	R5-198557	2463	-	Updated to RRM 6DL and 7DL CA test cases	16.2.0	16.3.0

2019-12	RAN#86	R5-198607	2464	-	Cell configuration mapping for RRM feMTC Test Cases	16.2.0	16.3.0
2019-12	RAN#86	R5-198608	2465	-	Editorial correction of Annex A	16.2.0	16.3.0
2019-12	RAN#86	R5-198609	2466	-	Test Tolerances for RRM feMTC Test Cases in Annex F	16.2.0	16.3.0
2019-12	RAN#86	R5-198612	2468	-	Correction of RRM feMTC Test Case 8.1.41	16.2.0	16.3.0
2019-12	RAN#86	R5-198613	2469	-	Correction of RRM feMTC Test Case 8.1.42	16.2.0	16.3.0
2019-12	RAN#86	R5-198614	2470	-	Correction of RRM feMTC Test Case 8.2.14	16.2.0	16.3.0
2019-12	RAN#86	R5-198615	2471	-	Editorial correction of RRM feMTC Test Cases	16.2.0	16.3.0
2019-12	RAN#86	R5-198617	2473	-	Addition of a new RRM feMTC Test Case 8.3.13	16.2.0	16.3.0
2019-12	RAN#86	R5-198621	2477	-	Addition of a new RRM feMTC Test Case 8.3.17	16.2.0	16.3.0
2019-12	RAN#86	R5-198622	2478	-	Addition of a new RRM feMTC Test Case 8.3.18	16.2.0	16.3.0
2019-12	RAN#86	R5-198623	2479	-	Addition of a new RRM feMTC Test Case 8.3.19	16.2.0	16.3.0
2019-12	RAN#86	R5-198624	2480	-	Addition of a new RRM feMTC Test Case 8.4.12	16.2.0	16.3.0
2019-12	RAN#86	R5-198625	2481	-	Addition of a new RRM feMTC Test Case 8.4.13	16.2.0	16.3.0
2019-12	RAN#86	R5-198626	2482	-	Addition of a new RRM feMTC Test Case 8.4.14	16.2.0	16.3.0
2019-12	RAN#86	R5-198627	2483	-	Addition of a new RRM feMTC Test Case 8.4.15	16.2.0	16.3.0
2019-12	RAN#86	R5-198628	2484	-	Editorial correction of RRM IncMon Test Cases	16.2.0	16.3.0
2019-12	RAN#86	R5-199450	2472	1	Addition of a new RRM feMTC Test Case 8.3.12	16.2.0	16.3.0
2019-12	RAN#86	R5-199451	2474	1	Addition of a new RRM feMTC Test Case 8.3.14	16.2.0	16.3.0
2019-12	RAN#86	R5-199452	2475	1	Addition of a new RRM feMTC Test Case 8.3.15	16.2.0	16.3.0
2019-12	RAN#86	R5-199453	2476	1	Addition of a new RRM feMTC Test Case 8.3.16	16.2.0	16.3.0
2019-12	RAN#86	R5-199475	2453	1	Addition of V2X RRM test cases 12.3.1 and 12.3.2	16.2.0	16.3.0
2019-12	RAN#86	R5-199476	2454	1	Update of V2X RRM test case 12.4	16.2.0	16.3.0
2019-12	RAN#86	R5-199477	2455	1	Addition of V2X RRM test case 12.5	16.2.0	16.3.0
2019-12	RAN#86	R5-199478	2456	1	Addition of V2X RRM test cases 12.6.1 and 12.6.2	16.2.0	16.3.0
2020-03	RAN#87	R5-200536	2486	-	Correction of definitions of Bandwidth-reduced Low-complexity or Coverage Enhanced UE	16.3.0	16.4.0
2020-03	RAN#87	R5-200537	2487	-	Cell configuration mapping for RRM feMTC Test Cases	16.3.0	16.4.0
2020-03	RAN#87	R5-200538	2488	-	Addition of a new RRM feMTC Test Case 5.1.28	16.3.0	16.4.0
2020-03	RAN#87	R5-200539	2489	-	Addition of a new RRM feMTC Test Case 5.1.34	16.3.0	16.4.0
2020-03	RAN#87	R5-200540	2490	-	Addition of a new RRM feMTC Test Case 6.1.18	16.3.0	16.4.0
2020-03	RAN#87	R5-200541	2491	-	Addition of a new RRM feMTC Test Case 7.3.69	16.3.0	16.4.0
2020-03	RAN#87	R5-200542	2492	-	Correction of RRM feMTC Test Case 8.3.16	16.3.0	16.4.0
2020-03	RAN#87	R5-200543	2493	-	Correction of RRM feMTC Test Case 8.3.17	16.3.0	16.4.0
2020-03	RAN#87	R5-200544	2494	-	Correction of RRM feMTC Test Case 8.3.18	16.3.0	16.4.0
2020-03	RAN#87	R5-200545	2495	-	Correction of RRM feMTC Test Case 8.3.19	16.3.0	16.4.0
2020-03	RAN#87	R5-200546	2496	-	Correction of RRM feMTC Test Case 8.4.12	16.3.0	16.4.0
2020-03	RAN#87	R5-200547	2497	-	Correction of RRM feMTC Test Case 8.4.13	16.3.0	16.4.0
2020-03	RAN#87	R5-200548	2498	-	Correction of RRM feMTC Test Case 8.4.14	16.3.0	16.4.0

2020-03	RAN#87	R5-200549	2499	-	Correction of RRM feMTC Test Case 8.4.15	16.3.0	16.4.0
2020-06	RAN#88	R5-201608	2501	-	Correction SIB5-NB 4.2.24	16.4.0	16.5.0
2020-06	RAN#88	R5-201609	2502	-	Correction RSRP-Threshold TC 6.2.16	16.4.0	16.5.0
2020-06	RAN#88	R5-202994	2503	1	Align eMTC RLM test cases to core spec	16.4.0	16.5.0
2020-06	RAN#88	R5-201611	2504	-	Correctly add evaluation limits 9.1.1.2_2	16.4.0	16.5.0
2020-06	RAN#88	R5-201789	2505	-	Updated to Annexes for Rel-15 NB-IoT test configuration	16.4.0	16.5.0
2020-06	RAN#88	R5-202086	2506	-	Editorial correction of clause 8.7A title	16.4.0	16.5.0
2020-06	RAN#88	R5-202087	2507	-	Test Tolerances for RRM feMTC Test Cases in Annex F	16.4.0	16.5.0
2020-06	RAN#88	R5-202088	2508	-	Correction of RRM feMTC Test Cases 8.3.12 to 8.3.19 with TT	16.4.0	16.5.0
2020-06	RAN#88	R5-202787	2509	1	Addition of 4.2.35 NB-IOT TDD-TDD Intra frequency cell reselection in normal coverage	16.4.0	16.5.0
2020-06	RAN#88	R5-202788	2510	1	Addition of 4.2.36 NB-IOT TDD-TDD Intra frequency cell reselection in enhanced coverage	16.4.0	16.5.0
2020-06	RAN#88	R5-202789	2512	1	Addition of 4.2.38 NB-IOT HD-FDD Intra frequency cell reselection in normal coverage with RRM measurement relaxation	16.4.0	16.5.0
2020-06	RAN#88	R5-202790	2515	1	Addition of 4.2.37 NB-IOT TDD-TDD Inter frequency cell reselection in enhanced coverage	16.4.0	16.5.0
2020-06	RAN#88	R5-202799	2500	1	Correction 4.2.18 PCID selection	16.4.0	16.5.0
2020-06	RAN#88	R5-202800	2513	1	Correction of message contents to e-MTC Intra-frequency Handover	16.4.0	16.5.0
2020-09	RAN#89	R5-203800	2516	-	Addition of 6.1.23 NB-IOT TDD Inter-frequency RRC Re-establishment in In-Band mode under normal coverage	16.5.0	16.6.0
2020-09	RAN#89	R5-203801	2517	-	Addition of 6.1.24 NB-IOT TDD - TDD Intra-frequency RRC Re-establishment in In-Band mode under enhanced coverage	16.5.0	16.6.0
2020-09	RAN#89	R5-203802	2518	-	Addition of 6.2.19 NB-IOT TDD Contention Based Random Access Test in normal coverage	16.5.0	16.6.0
2020-09	RAN#89	R5-203803	2519	-	Addition of 6.2.20 NB-IOT TDD Contention Based Random Access Test in enhanced coverage	16.5.0	16.6.0
2020-09	RAN#89	R5-203933	2520	-	Addition of sTTI related definitions, symbols and abbreviations to TS 36.521-3	16.5.0	16.6.0
2020-09	RAN#89	R5-203936	2523	-	Addition of downlink RMC configuration with sTTI	16.5.0	16.6.0
2020-09	RAN#89	R5-203997	2524	-	Correction Test applicability of test case 9.2.56 and 9.2.57	16.5.0	16.6.0
2020-09	RAN#89	R5-204024	2525	-	Correction of Table 9.2.18.1.3-2 and Table 9.2.18.2.3-2	16.5.0	16.6.0
2020-09	RAN#89	R5-204047	2527	-	Correction to intra-frequency event triggered reporting test case in CEModeA	16.5.0	16.6.0
2020-09	RAN#89	R5-204048	2528	-	Correction to E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for CE UE in CEmodeA	16.5.0	16.6.0
2020-09	RAN#89	R5-204109	2530	-	Correction of RRM feMTC Test Case 5.1.34 including Test Tolerance	16.5.0	16.6.0
2020-09	RAN#89	R5-204110	2531	-	Correction of RRM feMTC Test Case 6.1.18 including Test Tolerance	16.5.0	16.6.0
2020-09	RAN#89	R5-204111	2532	-	Correction of RRM feMTC Test Case 7.3.69 including Test Tolerance	16.5.0	16.6.0

2020-09	RAN#89	R5-204112	2533	-	Correction of RRM feMTC Test Cases 8.4.12 - 15 including Test Tolerance	16.5.0	16.6.0
2020-09	RAN#89	R5-204113	2534	-	Test Tolerances for RRM feMTC Test Cases in Annex F	16.5.0	16.6.0
2020-09	RAN#89	R5-204158	2535	-	Correction to test applicability of NB-IoT RRM tests	16.5.0	16.6.0
2020-09	RAN#89	R5-204731	2526	1	Editorial update of Annex C.3.3.1	16.5.0	16.6.0
2020-09	RAN#89	R5-204798	2521	1	Addition of new test case 7.2.13 E-UTRAN FDD Timing Advance Adjustment Delay Test for sTTI and short processing time	16.5.0	16.6.0
2020-09	RAN#89	R5-204799	2522	1	Addition of new test case 7.2.14 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for sTTI and short processing time	16.5.0	16.6.0
2020-09	RAN#89	R5-204978	2529	1	Correction of RRM feMTC Test Case 5.1.28 including Test Tolerance	16.5.0	16.6.0
2020-12	RAN#90	R5-205076	2539		Void obsolete RRM test cases - Annex E	16.6.0	16.7.0
2020-12	RAN#90	R5-205087	2540		Introduction of LTE Bands 87 and 88 in Group of band definitions	16.6.0	16.7.0
2020-12	RAN#90	R5-205693	2544		Update to test applicability of NB-IoT RRM tests	16.6.0	16.7.0
2020-12	RAN#90	R5-205768	2546		Addition of conditions for sTTI and short processing time	16.6.0	16.7.0
2020-12	RAN#90	R5-205849	2548		Correction of PDSCH parameter for event triggered reporting TC 8.1.26	16.6.0	16.7.0
2020-12	RAN#90	R5-205850	2549		Correction of sr-ConfigIndex for RSRP TC 9.1.53	16.6.0	16.7.0
2020-12	RAN#90	R5-205892	2551		Update of 4.2.36 NB-IOT TDD-TDD Intra frequency cell reselection in enhanced coverage	16.6.0	16.7.0
2020-12	RAN#90	R5-205893	2552		Update of 4.2.37 NB-IOT TDD-TDD Inter frequency cell reselection in enhanced coverage	16.6.0	16.7.0
2020-12	RAN#90	R5-205895	2553		Update of 4.2.38 NB-IOT TDD-TDD Intra frequency cell reselection in normal coverage with WUS	16.6.0	16.7.0
2020-12	RAN#90	R5-205897	2554		Update of Annex E and F for NB-IOT TDD RRM test cases 4.2.35 to 4.2.38	16.6.0	16.7.0
2020-12	RAN#90	R5-206710	2545	1	Update of UE Timing Advance Adjustment Accuracy Test for sTTI	16.6.0	16.7.0
2020-12	RAN#90	R5-206755	2547	1	Update of NB-IoT Test Cases in TDD mode	16.6.0	16.7.0
2020-12	RAN#90	R5-206756	2550	1	Update of 4.2.35 NB-IOT TDD-TDD Intra frequency cell reselection in normal coverage	16.6.0	16.7.0
2020-12	RAN#90	R5-206780	2536	1	Void obsolete RRM 3CC test cases - Chapter 8	16.6.0	16.7.0
2020-12	RAN#90	R5-206781	2537	1	Void obsolete RRM CA test cases - Chapter 9	16.6.0	16.7.0
2020-12	RAN#90	R5-206782	2538	1	Void obsolete RRM 4CC and 5CC test cases - Chapter 8	16.6.0	16.7.0
2020-12	RAN#90	R5-206898	2541	1	Adding new TC 9.1.71 6 DL RSRP for E-UTRAN in CA	16.6.0	16.7.0
2020-12	RAN#90	R5-206899	2542	1	Adding new TC 9.2.58 6 DL RSRQ for E-UTRAN in CA	16.6.0	16.7.0
2021-03	RAN#91	R5-210890	2567	-	Addition of Cell configuration mapping for NB-IoT RRM TDD Test Cases in Annex E	16.7.0	16.8.0
2021-03	RAN#91	R5-210892	2569	-	Update of MU for addition of new NB-IoT TDD Test Cases	16.7.0	16.8.0
2021-03	RAN#91	R5-211753	2555	1	Addition of new test case 9.1.72	16.7.0	16.8.0
2021-03	RAN#91	R5-211754	2556	1	Addition of new test case 9.2.59	16.7.0	16.8.0

2021-03	RAN#91	R5-211758	2573	1	Introduction of MU and TT for CA Idle Mode Measurements	16.7.0	16.8.0
2021-03	RAN#91	R5-211759	2570	1	FDD Inter Frequency Absolute RSRP Accuracy CA Idle Mode Measurements for Non-Overlapping Carrier	16.7.0	16.8.0
2021-03	RAN#91	R5-211760	2571	1	FDD Inter Frequency Absolute RSRP Accuracy CA Idle Mode Measurements for Overlapping Carrier	16.7.0	16.8.0
2021-03	RAN#91	R5-211761	2572	1	FDD Intra Frequency Absolute RSRP Accuracy CA Idle Mode Measurements	16.7.0	16.8.0
2021-03	RAN#91	R5-211790	2561	1	Addition of 6.2.21 TDD Contention Based Random Access on Non-anchor Carrier Test for UE category NB1 UEs In-band mode in Enhanced Coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211791	2562	1	Addition of 7.1.27 E-UTRAN TDD UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211792	2563	1	Addition of 7.1.28 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211793	2564	1	Addition of 7.2.15 E-UTRAN TDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhanced Coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211794	2565	1	Addition of 7.3.88 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211795	2566	1	Addition of 7.3.89 TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in enhanced coverage	16.7.0	16.8.0
2021-03	RAN#91	R5-211847	2568	1	Correction of Table number for RRM Radio Link Monitoring Test Cases	16.7.0	16.8.0

History

Document history		
V16.5.0	September 2020	Publication
V16.6.0	November 2020	Publication
V16.7.0	February 2021	Publication
V16.8.0	June 2021	Publication